

THE IRON AGE

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THE IRON AGE

New York, Thursday, September 24, 1908.

A Powerful Russian Hydraulic Dredge.

BY H. PRIME KIEFFER, BERLIN, GERMANY.

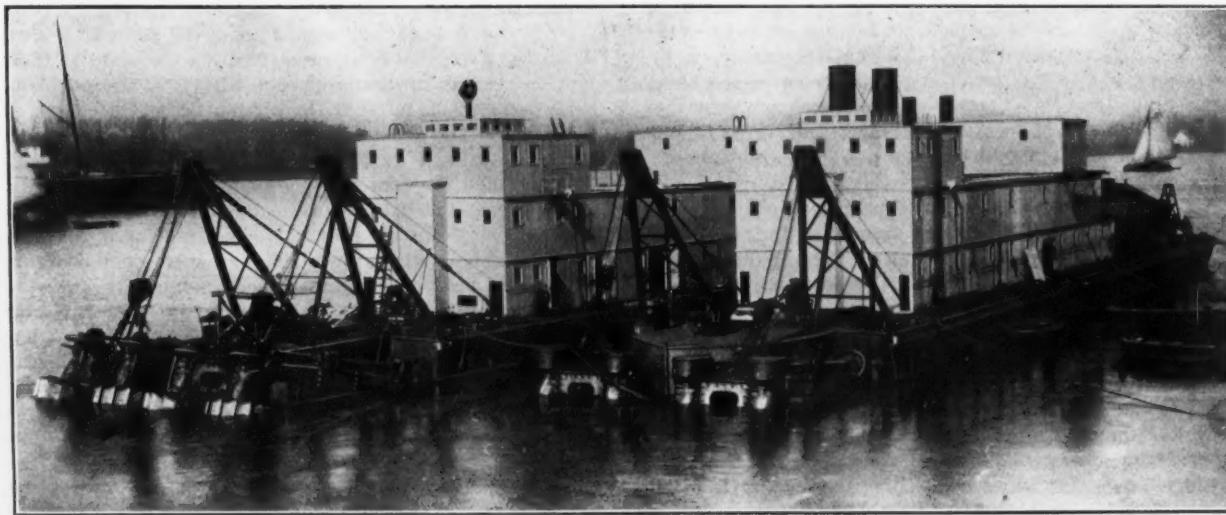
The most powerful dredge ever constructed is shown in the accompanying illustrations. It is one of the hydraulic type, and was built in Belgium at the Liege works of the Société John Cockerill for the Russian Government from the plans of Lindon W. Bates of New York City. The performance of this compound dredge is marvellous, and in the tests it developed an almost incredible capacity.

The Russian dredge is built in two parts, as is shown in the half-tone engravings. It is constructed in this manner as its breadth was limited to the width of the canal system Marie, through which it passed on its way from the Baltic Sea to the Volga River. This double dredge can be operated as a whole, making a bottom cut 62 ft. wide, or each half can be operated separately, as is usually the case. Each half measures 216 ft. long by 31½ ft. wide and 9 ft. deep. At light draught the hull draws 4 ft., and the working draught is 8 in. greater.

The Volga dredge is electrically self-propelled and

Each dredge is propelled by two 4-ft. diameter screws. In front are also arranged two screws for maneuvering the vessel. Each of the four screws is operated by a direct connected 550-volt, 135 hp. motor. Maneuvering may also be accomplished by means of cables turning around the drums of windlasses installed on the bridge in front. The same windlasses serve also for lifting the suction tubes and cutters by means of cranes arranged in front on the bridge. A vertical lathe indicates automatically the depth of the dredging. The cutters are operated by a double compound engine, installed in front under the bridge.

Each one of the two hulls is provided with a double bottom over two-thirds of its length, made of Cockerill steel. In front is the dredging apparatus proper. It consists of four large drums or drills, the peripheries of which have sharp steel knives or cutters, which by rotating loosen the material to be dredged. The drills are hollow, and through them a powerful centrifugal pump



The Compound Dredge Designed by Lindon W. Bates, New York, and Constructed by the Société John Cockerill, Belgium, for the Russian Government.

controllable, the electric installation of each half consisting of a 600-kw. generator directly connected to a quadruple-expansion engine. The generators supply two stern motors and two bow motors, each of 125 hp., mounted in the distributing pontoon, and arranged to control the position of the pontoon line as required by operations. Lighting is done from a separate installation. Control of all motors is centralized in the pilot-house.

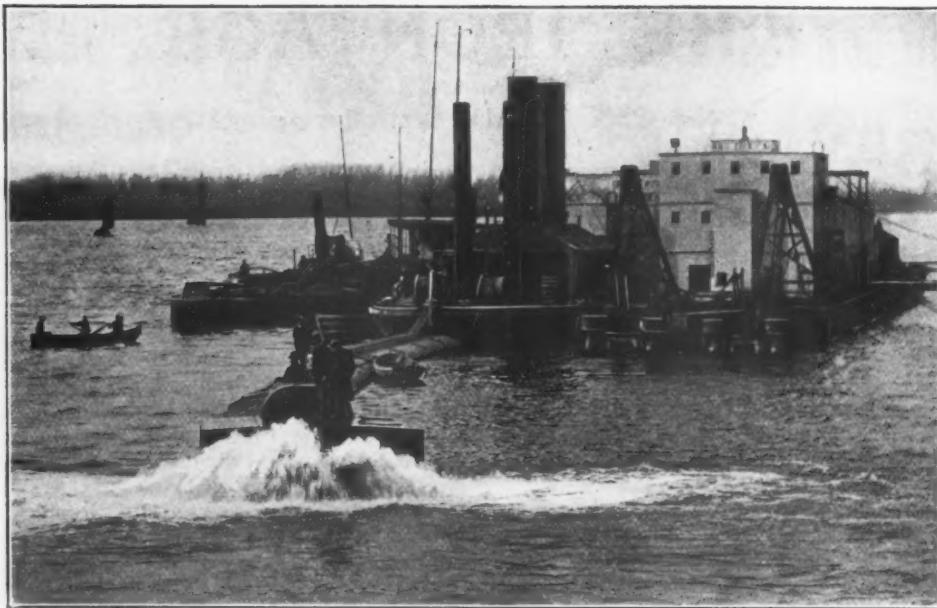
The dredge is propelled by screws driven by electric motors; all other movements are effected by the direct use of steam. The fundamental idea in installing the electrical equipment and all the machinery was that the directing mind in the operating room might have close at hand and always ready for instant use the means to stop, start, or modify all the movements of the great machine. To this end the control of the entire electrical apparatus is placed to the right and left of the operator in the pilot house in the form of switches, rheostats, controllers, and compensators. Three-phase, alternating current is used, which permits cheaper and lighter machinery, and promises less trouble in maintenance, than direct current, although bringing with it difficulties peculiar to itself. The entire equipment was furnished by the General Electric Company, Schenectady, N. Y., and so far as possible the apparatus is standard.

sucks the material loosened by the cutters and forces it to a long line of pontoons arranged behind the dredge. About amidships is located the centrifugal suction and force pump, which is operated by a vertical triple-compound engine.

The suction pipes from the drills unite in two lines which are again united at the suction end of the pump. The discharge from the pump is a single central pipe, through which the material is forced. This pipe connects at the stern of the vessel with the distributing pontoons mentioned above. Behind the engine room is the boiler room, containing four Babcock & Wilcox water tube boilers, fired exclusively with naphtha.

The pipe pontoons are elliptical air jackets, reversible and not easily affected by winds, waves, or currents. Metal joints are used, as these do not obstruct the discharge stream so much as rubber connections. Each pair of compound cutter engines actuates four cutters. Each main pump engine can develop 1500 indicated horsepower.

Mr. Bates in designing the Volga dredge did not set himself so much the task of exceeding former capacity trials (output must always have a ratio to the size and power of engines), but rather the task of supplementing the first achievement by the additions of self-actuating features, which would eliminate loss of time in maneu-



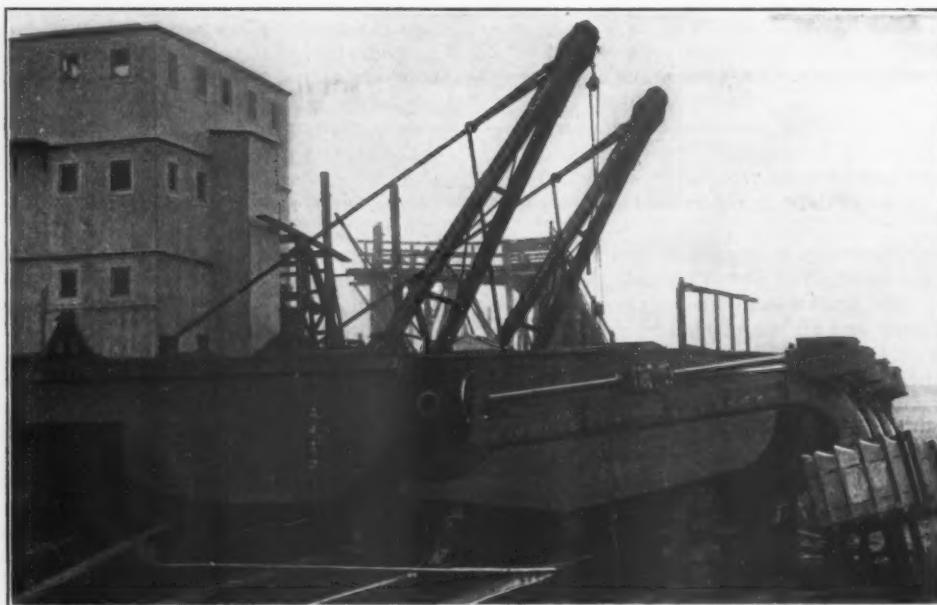
A View of the Dredge at Work During the Trials on the Scheldt River.

vering and in adjusting lines. To insure that the mixture of solid matter and water shall be of the right proportion for the most efficient dredging, four Bates cutters are mounted on each of the two hulls forming the dredger. In order that work may be done at different depths, these cutters, through proper mechanism described later, can be raised and lowered on a fixed horizontal axis on the dredge. The cutters can work to a depth of 16 ft. The cutter engine, in the forward part of the hull, drives a shaft, which coincides with the horizontal axis of the cutter carriage, and through bevel gears and secondary shafts the power is transmitted to the cutter shafts.

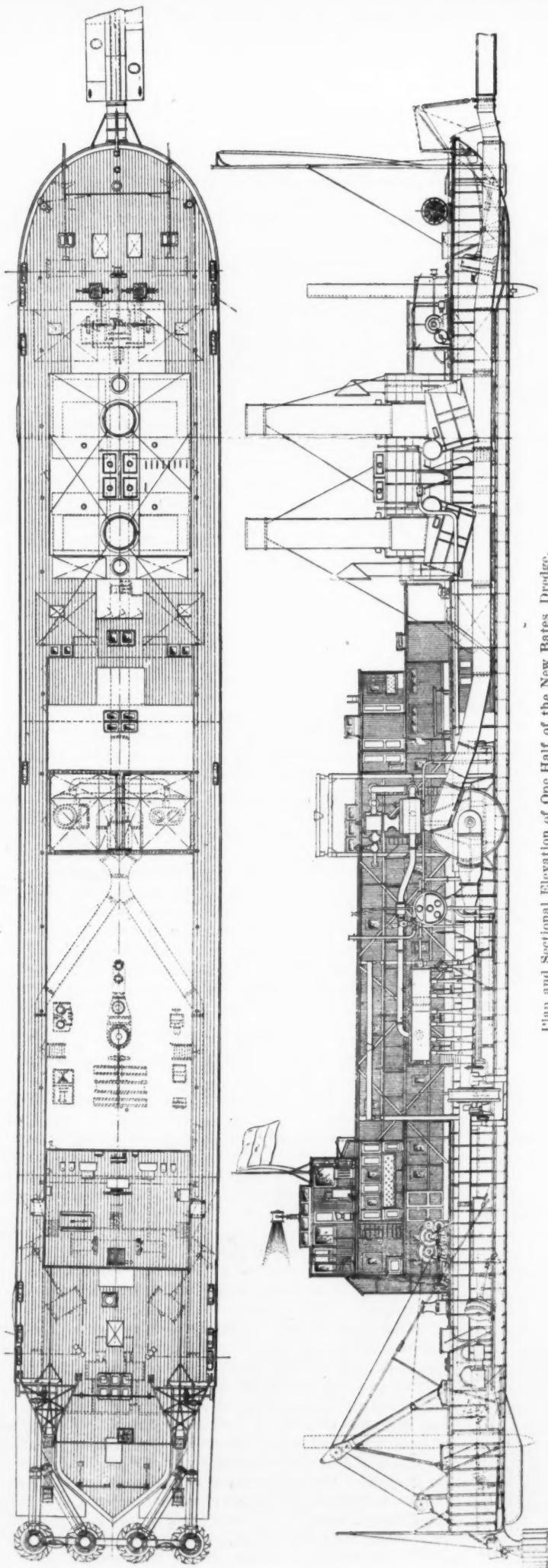
When the cutters are down in normal working condition they may work backward as well as forward, taking a face the full depth of the cutter. The greater part of the weight of the cutters and the suction pipes is carried by two hoisting cables through sheave-blocks and sheave-legs to the hoisting drums, and by these the depth of the cutters is regulated. The bearings which are under water are protected chiefly by a constant stream of water fed to the center of each journal, at a pressure of about 60 lb. from a special pump on the dredge. Removable sheet iron covers with handholes are placed over all gears which are under water. The pipe throughout is of cast steel, and is supported at the hull by two trunnions, which are carried by strong cast steel bracket bearings. The trunnions are bored out around the center of rota-

tion to permit the countershaft to pass through the inner one. The shaft has an outward bearing midway between the trunnion bearings.

The design of the pontoon carrying the discharge differs somewhat from any heretofore employed. The displacement is such that when the contained pipe is fully loaded the draught of the pontoons is not quite 2 ft. With the exception of the two forming the ends of their respective lines of discharge pipe, all are of uniform construction. Each is 50 ft. long from center to center of couplings. The cross-section is elliptical, the horizontal axis measuring 9 ft. 3 in. and the vertical axis 3 ft. 3 in. Through the center of the pontoon is placed the discharge pipe, which is 33 in. in diameter. Thus the pontoon proper forms an elliptical jacket for the pipe whose axis coincides with its own. The greatest wear being on the lower half of the pipe, there is an advantage in being able to invert it, which the symmetrical form of the pontoon makes a simple matter. This section also has an advantage over the circular in having less draught, and a stable equilibrium enabling the men to walk freely along the line. There is also an advantage over the rectangular form, as there are no edges, and hence no longitudinal angles with corresponding increase in the amount of riveting. The form is one least influenced by wind, waves, or current. The total length of the pontoon and the angle of deflection to be allowed at the coupling are determined by the curvature required of the line of



View Showing the Cutting Mechanism of One of the Halves of the Compound Dredge Out of Water.



Plan and Sectional Elevation of One Half of the New Bates Dredge.

pontoons as a whole. In this case, the length of pontoon adopted being 50 ft., 10 degrees was fixed as the angle to which the coupling must permit deflection. This gives the line of pontoons a maximum possible curvature which corresponds to a railroad curve of about 20 degrees, or the whole line of 1000 ft. can be brought to a little more than a semicircle.

The distribution of the material is always of interest. It is usually not enough that material excavated by the dredge shall be discharged a certain distance. The place of deposit must in most cases be regulated. The control of the end of the pontoon line may be accomplished in various ways. As a first requisite, it is necessary that unbalancing produced in the interior of the discharge pipe by the free discharge shall be compensated, in order that the pontoon line may hold the position given it without tendency to writhe or kink. That being accomplished, motion may be given to the discharging pontoon by altering the direction of the outflow, by independent means, or by both. The latter plan has been adopted here. The simplest and the usual expedient for balancing the reaction is by a baffle plate, held by fixed or adjustable stays, just back from the end of the pipe, and nearly perpendicular to the discharging stream whose impact it receives. In the present case, the ordinary baffle plate is supplemented by two curved plates in front and bearing on it. These plates form a vertical wedge which is normally in the middle of the discharge stream, dividing it in equal parts and deflecting both equally to right and left. On the back of the wedge is a horizontal rack, moved by a pinion, which receives its rotation from the pontoon through a hand-wheel and a worm gear. By moving this wedge to one side or the other the horizontal balance of the deflected stream is destroyed, and transverse motion to the pontoon is thus imparted.

Before the dredge departed for the Volga River it was subjected to trials by the Russian Government. One set of tests for one-half of the dredge was conducted in a basin of about 40 acres at Drygoten, Belgium, and the other at Steendorf, on a bar in the river Scheldt, about 10 miles above Antwerp. After a number of unofficial trials had taken place the official trials began with a crew which had become familiar with the mechanism of the dredge. In this trial at Drygoten the result was as follows:

Distance run.....	1,000 ft.
Time	37½ min.
Advance per minute.....	28.8 ft.
Average cut.....	2.44 ft.
Rate per hour.....	4,524 cu. yd.

The material in this cut was favorable, half of it being a loose sand, the other half a compacted sand mixed with clay.

The other half of the dredge was tested at Steendorf, on a bar composed of very fine sand; some cuts were along hard packed material, others in material relatively loose. None of the material in the Scheldt is so favorable as the coarse, loose sand met with on the cross-over bars of the Mississippi or the Volga. This test at Steendorf resulted as follows:

Distance run.....	2,129 ft.
Time	180 min.
Advance per minute.....	11.83 ft.
Average cut.....	3.52 ft.
Rate per hour.....	2,810 cu. yd.

The material here was fine compact sand. All tests were conducted with 700 ft. of discharge pipe. All measurements were in excavation, and to determine the capacity upward of 500 soundings were taken. At the termination of the trials it was officially considered that the dredge could be rated without exaggeration as having a capacity of about 7000 cu. yd. hourly. This means, then, that this dredge working in material which is at all favorable can take out about 2,000,000 cu. yd. of material in a month, working 10 hours daily.

Foundry Cupola Construction.*

Varied Requirements of a Wide Range of Practice.

BY THOMAS D. WEST.

In years back, when one foundry was supposed to make almost everything from stove plate to an anvil block, the one arrangement of a cupola was made to answer all purposes. In other words, it was a jobbing cupola that was not pressed severely by competition. Our great diversity of specialties to-day has brought about such a demand for corresponding differences in cupolas that the wise founder will learn what features he should have in a cupola that it may best meet special conditions.

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2. A cupola that can run at intervals of 1 to 2 hr., but without dropping its bottom for from 4 to 8 hr.
3. A cupola that can melt fair sized heats of very fine or dirty scrap alone or mixed with pig iron.
4. A cupola to melt steel scrap, tin scrap or sheet iron mixed with grades of cast iron scrap or pig iron.
5. A cupola that will burn out the lining the least.
6. A cupola capable of melting large heats in proportion to capacity most speedily.
7. A cupola that can melt a large heat in the shortest time, or as fast as the metal can be taken away from it.
8. A cupola most economical in its use of fuel.
9. A cupola requiring the least labor in cleaning out and the droppings from which are freest of shot iron.

CUPOLAS FOR GENERAL PURPOSES.

10. A cupola that can hold from 2 to 10 tons before being tapped.
11. A cupola from which metal can be taken continuously.
12. A cupola that will give the best "hot" and clean iron.
13. A cupola that can best melt very large scrap.
14. A cupola best adapted to the use of coke or coal or the two mixed.
15. A cupola that can melt a large or medium heat slowly so that its metal can be taken steadily by occasional taps in the lapse of 5 to 9 hr.

All of the above different features involve more or less blending of variations that make a very interesting study in the flexibility of cupola practice. In treating of the special points raised, the writer can only cite the main conditions involved, but these should be sufficient to place any one at all conversant with founding in the way of attaining the desired ends.

POINTS OF CONSTRUCTION.

In taking up a brief description of the chief features and combinations required in the construction of cupolas, we will refer in order to the foregoing numbers:

1. Those that must have the main tuyeres from 3 to 4 ft. above the bottom plate; a slag hole 12 to 18 in. below the bottom of the tuyeres, and two to three rows of tuyeres. The cupola should have a height of 16 to 20 ft. from its bottom plate to the bottom of the charging door, and not less than 60 in. inside diameter; the walls to be generally of a straight character.

* Read at a meeting of the New England Foundrymen's Association, Boston, Mass., September 9, 1908.

2. This calls for a cupola so arranged that all openings below the charging door can be closed to prevent the admission of air at any point. It should have a large breast that can be removed at the end of every period in melting, to take out all iron droppings and slag before banking. This latter holds the incandescent fuel from further burning until all is again ready to charge more fuel and iron and put on the blast. If a warm blast is used the better the success in continuing such intervals of melting. The principle adopted by the Baillot patent cupola shown at the American Foundrymen's Association convention at Toronto in June, 1908, is excellent for intermittent melting.

3. A cupola for this will also serve for No. 4. It should have two rows of tuyeres, the bottom row being from 24 to 36 in. above the bottom plate and having a slag hole 10 to 14 in. below the bottom of the tuyeres. The cupola should be from 36 to 50 in. inside diameter, but if larger than 60 in. a center blast would be found very advantageous. In height such cupolas should range from 10 to 16 ft.

5. The best of all features for this is center blast alone or in combination with outside tuyeres, when used in cupolas over 60 in. inside diameter. Without center blast the lining would need to be brought in at the lower tuyeres, and the latter should have large openings. Upper tuyeres are not used in this cupola for reasons stated later. This cupola should also be sufficiently large in diameter to permit of medium sized heats and a mild blast.

6. This cupola invariably calls for high tuyeres and a slag hole 8 to 12 in. or more below the bottom of the tuyeres. It is best to have upper tuyeres, and flux should be charged with the fuel and iron to help form a fluid slag that can be run off between taps after the cupola has been melting about 30 min. Blast should range from 8 to 12 oz. pressure and pass through large area tuyeres. Cupolas under 50 in. inside diameter are best with a straight lining; over 60 in. the lining could be brought in or boshed or a center blast could be used.

7. This must be of a large size for its capacity, have low tuyeres and no slag hole. The tuyeres should be of large area and it is all the better if there is an upper row. With cupolas over 40 in. inside diameter, the tuyeres may well be brought inward or boshed, or if the diameter is over 60 in. a center blast should be used, the blast pressure to range from 10 to 15 oz. This is a cupola most desired by shops having a large force of men who pour off as soon as possible. Such cupolas cannot be expected to be the most economical in fuel, but if they can cut down the time of a large force, 15 min. saved on every heat pays for considerable fuel.

FOR FUEL ECONOMY.

8. In this case we have first to consider that whatever size is used, the cupola will be run to near the limit of its capacity. We have then to figure on a high cupola having tuyeres of large area brought in to work in connection with upper ones, and if over 60 in. inside diameter, to use a center blast in combination with the outside tuyeres. There must also be a slag hole 6 in. below the tuyeres and this is to be used after a cupola has run about one-third of its heat. The bottom row of tuyeres should be of fair area and range from 18 to 24 in. in height from the bottom plate. Blast pressure is 8 to 10 oz. If this cupola cannot be run to its capacity, then lower the tuyeres 6 to 8 in. and dispense with the slag hole. The manipulation of such cupolas has also very much to do with the question, as a founder well versed in his own cupola and having progressive ideas will use much less fuel than one following the opposite policy.

9. Two plans may be adopted for this work. The first is to utilize a cupola after the features embodied in No. 7. The second is to use a center blast, or fairly high tuyeres of large area, and in all cases where cupolas are to be run over one-half of their capacity to utilize a slag hole to its best efficiency. In no case should any cupola be run over the limit of working in good order if a saving in cleaning out and in shot iron is an object for consideration above the other points.

10. An ordinary cupola having a slag hole and the

height of tuyeres gauged to the greatest amount of metal desired to be held before tapping.

FOR CONTINUOUS POURING.

11. This as a rule calls for a cupola larger than necessary for melting the size of the heat required, as with a continuous flow the metal should come down in a stream sufficient to prevent dull iron. As a rule such cupolas can be worked with low tuyeres, which means greater economy in fuel than having high ones for short heats, and do not require a slag hole. Upper tuyeres could be used here to increase the speed of melting; otherwise they can be omitted.

12. This demands large tuyere areas and in large cupolas bringing the tuyeres in all that is practical, or the use of a center blast in connection with the outside tuyeres. The bottom of the tuyeres should be from 12 to 16 in. above the bottom plate, and the fuel should be carried up to support the iron as high above the top of the tuyeres as a blast pressure of 10 to 12 oz. will carry it to best locate the melting point. If a cupola requires to hold large bodies of metal before being tapped or to run long heats for its capacity, then it will be necessary to carry the tuyeres higher and use a slag hole. Upper tuyeres would also be found serviceable here as an aid to the running of long heats.

13. The ends are best served here for medium heats by having the lower tuyeres from 14 to 18 in. above the bottom plate. The tuyeres should be of medium areas, and the blast pressure range from 12 to 16 oz. A good pressure is needed for such work, because it is wise to carry a high bed to keep the heavy iron from settling down in dangerous proximity to the lower tuyeres. If the cupola is to run long heats for its rated capacity, the tuyeres should range from 8 to 12 in. higher and there should be upper tuyeres and a slag hole. The height of the cupola from its bottom plate to the charging door should be of medium range. These cupolas are also best provided with a crane or other appliance by which very heavy bodies of iron can be lowered slowly to the bed. The largest single piece of iron the writer knows of being melted in a cupola was a solid block weighing three tons. This was melted by the Pratt & Whitney Company, Hartford, Conn., in a cupola 40 x 50 in. inside measurement, using all hard coal for fuel.

14. In using coal, lower and smaller tuyeres are utilized than with coke, and if the two are mixed an average should be struck in placing the tuyeres. The rule for slag hole is the same with one as the other, only there is not as much slag coming from hard coal as from coke. Cupolas for coal can be of less height than for coke. Much slower melting may be expected with the former than with the latter.

15. The conditions for this cupola are largely the opposite of those required for No. 7. Here we require a cupola small in proportion to output, with high and large tuyere areas, and a slag hole well below the tuyeres. If the cupola is over 50 in. inside diameter, it is best to bring the tuyeres inward, or if over 60 in. to use a center blast. The blast pressure, ranging from 4 to 8 oz., is regulated largely by the fluidity of the metal required. The hotter it is wanted, the higher the bed of fuel needed and hence higher pressure of blast. Upper tuyeres work well in this cupola.

Manipulation of Cupolas.

By large tuyere areas we mean having the openings for the admission of blast to the interior of the cupola equal to about 25 per cent. of the area at the melting point. The minimum area for tuyere openings should not be less than 6 per cent. of the area at the melting point. Small tuyeres may in some cases do for melting with all hard coal, but for coke large tuyeres are best.

In reference to the use of upper tuyeres it is to be understood that these create another melting zone. That means the additional burning out of a lining. It is chiefly in the case of running long heats and where a slag hole is necessary that upper tuyeres are most efficient. The disadvantage of the extra burning out of the lining is often so serious, that whatever advantages may be gained have but little weight.

The function of upper tuyeres is to deliver needed

oxygen to the escaping carbon monoxide, thereby preventing a loss of heat. As far as this is concerned, the principle is correct and any who take advantage of it without being too seriously handicapped by the extra burning out of a lining, will find that upper tuyeres save fuel and permit a cupola to run long heats with less "bunging up" than otherwise. It is generally best to have upper tuyeres built in a cupola, and when not found of advantage they may be easily stopped up with valves and clay.

Where reference is made to a slag hole, it is to be kept in mind that the greater the distance between the slag hole and the under side of the bottom of the tuyeres within limits, the better for running long heats or melting down fine or dirty stock. Having a slag hole implies the use of limestone or other flux to create a fluid slag.

The blast pressure given with the forms for construction is to be understood as applying to coke. Where hard coal is used, the pressure will need to be from 4 to 8 oz. higher.

Center Blast.

Although the writer has used center blast most successfully for over six years and strongly recommends it for general use in large cupolas, he does not expect many to adopt it on account of a fear most foundrymen seem to have that it will cause them trouble.

Those who are too timid to try center blast may have recourse to the design exhibited by John C. Knoeppel at the convention in Toronto. This form of a cupola has ample tuyere area and can be brought inward or boshed for large cupolas and made to meet other conditions referred to above. Wherever a center blast is used in connection with outside tuyeres the lining of the cupola is to be kept straight, as the center blast makes it unnecessary to bring the outside tuyeres inward beyond the face of the lining to form a bosh.

One notable advantage of a center blast lies in permitting the use of a mild blast. The oxygen of the air and not pressure is what the fuel demands to cause combustion. We use pressure merely to force the oxygen in the air to the exterior and central portions of the fuel body. The greater this pressure the more cooling and "bunging-up" effect it has on the body of stock facing the tuyeres when using cold blast. We can continue this cooling effect until a cupola is completely "bunged up." Could we but have a hot blast as convenient as a cold blast, many of the difficulties encountered by founders in having bunged tuyeres and bad melting would be avoided. This point was well demonstrated by the Baillot cupola at the last convention of the American Foundrymen's Association by the manner in which it could be banked and restarted to melt down iron at intervals.

Something besides the mere cupola is to be considered in securing its best efficiency for different conditions. Any one contemplating the purchase of a cupola should know what is to be required of it, and then see that it has a combination of the features that are best for the special conditions. After erecting a cupola, of course, a great deal depends upon its manipulation, but the best operator cannot make up for the lack of a construction meeting the special purpose for which the cupola is to be used.

In the German Empire, according to a report of United States Consul Norton of Chemnitz, Germany, there are 58 cities of a population of 50,000 or more. Of these 44 own and operate gas works, 38 operate electric light plants, 10 street railroads and 43 water works. From the electric lighting plants it is stated that \$4,200,000 a year has been cleared, but the allowance for depreciation is not given. It is estimated that German municipalities now have nearly \$1,000,000,000 invested in plants for public utilities. The consul says there is little evidence that municipalities will invade indiscriminately the field of general industrial competition. "Municipal control is established when there is simply the choice between a public and a private monopoly, as in the case of gas, water, electricity, &c., or else when the desirability of a utility is unquestioned, but the uncertainty as to profitable returns fails to attract private capital."

The National Tube Company's Exhibit.

Shown in Mechanical Hall, Sesqui-Centennial Exposition, Pittsburgh, Pa.

The Pittsburgh sesqui-centennial is to be commemorated with appropriate observances from September 27 to October 3, and with this in view the local manufacturers are making more elaborate displays of their products than usual at the Pittsburgh Exposition, which opened September 2 and is to close October 24. In the accompanying illustrations Fig. 1 shows a general view of the exhibit of the National Tube Company. The exhibit is especially interesting, as it not only shows the variety of the company's products, but also the high quality of the steel used. The fence around the side

seamless steel tubing is made. This bloom weighs about 1100 lb. The size of a section of this bloom is $\frac{7}{8} \times \frac{7}{8}$ in.

(2) A solid rolled round billet of low carbon steel—the first stage in the manufacture of this tubing.

(3) Pierced billet. (This is No. 2, but a piercing joint has rendered the billet hollow.) No. 3 is about five times the length of No. 2.

(4) Next operation in making hot drawn boiler tubes. This is No. 3 elongated, and it has acquired a smoother finish.

(5) Product of last operation in making hot drawn boiler tubes. The surface is smooth, the tube is round and true to gauge.

(6) This is similar to No. 3, but in this case the tube is to be made by cold drawing on a draw bench.

(7) A pierced, rolled and reeled billet. (No. 6 with one more operation.) The surface is smoother, and it is about twice as long, with a consequent reduction in the walls.

(8) The finished product—a Shelby cold drawn seamless boiler tube. The ends are cut off square, the hydraulic test has been applied and the tube is ready for the market.

(c) Some Shelby seamless boiler tube test pieces:

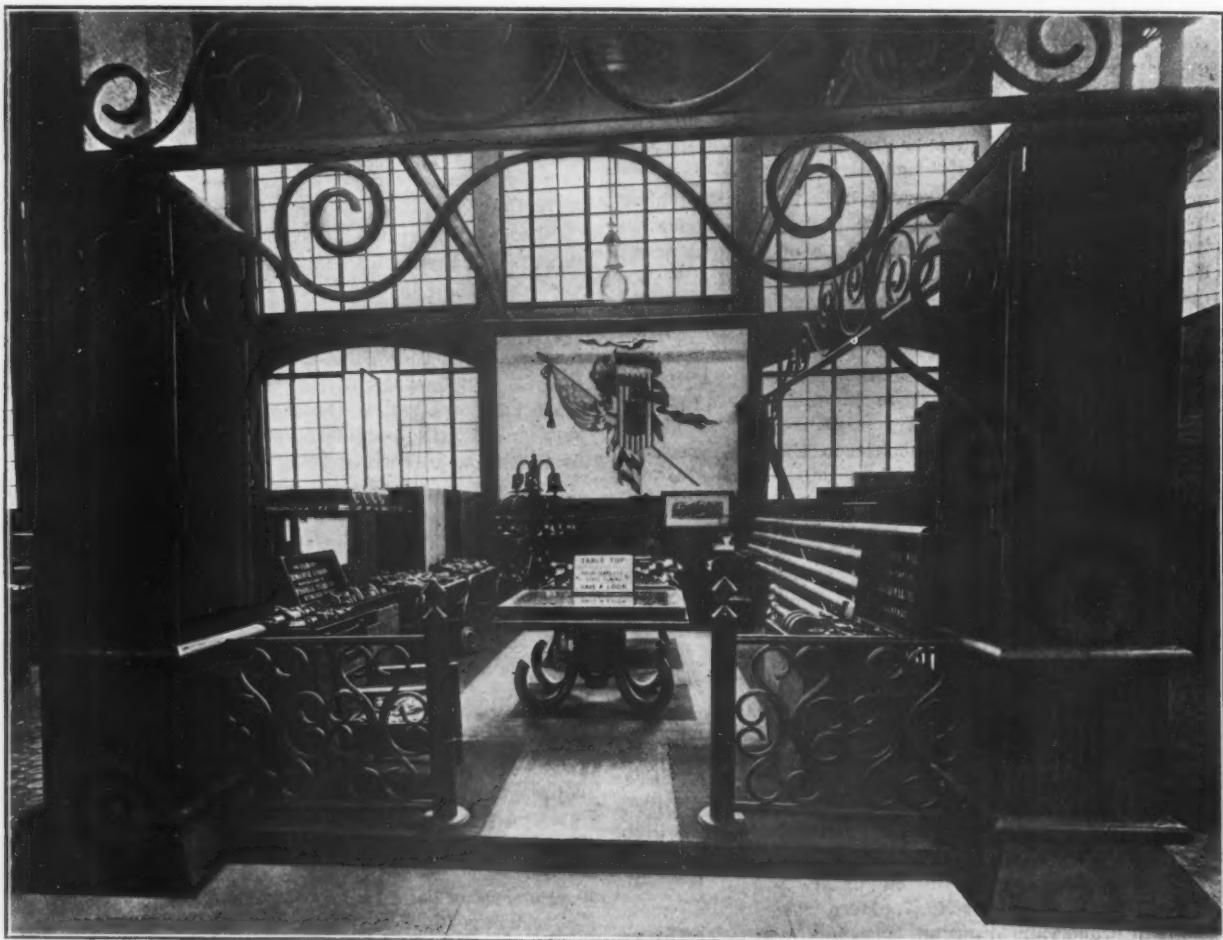


Fig. 1.—General View of the National Tube Company's Exhibit at the Pittsburgh Exposition, Comprising Shelby Seamless Steel Tubing, National Welded Tubular Material and Kewance Fittings and Valves.

and front of the booth is made from Shelby seamless steel tubing, bent in to represent grill work. The columns in front are entirely covered by square, seamless steel tubing capped by sections of round tubing going around and entirely concealing the columns. Following is a description of the exhibits:

(a) Table made from Shelby seamless steel tubing. The sides are made from tubing cut lengthwise, the bottom from large pieces of tubing bent, and the top from hundreds of pieces of tubing of various shapes and sizes. As will be noted in Fig. 1, this table is made according to a symmetrical design—that is, all the parts are grouped around the center, and if the finger is placed on any one piece its counterpart will be found at a similar position on each of the four sides of the center. Eight men are necessary to move this table.

(b) An exhibit of a large rack made of square, round end and rectangular seamless tubing in different sizes, to hold a number of pieces enumerated below, descriptive of the method of making Shelby seamless steel boiler tubes:

(1) Low carbon bloom. The raw material from which Shelby

(1) A piece of 4-in. 10 gauge hot finish tube, tested to 4200 lb. hydrostatic pressure. The tube did not burst, but is appreciably enlarged in diameter in places.

(2) A piece of 4-in. 10 gauge hot finish tube, burst at hydrostatic pressure of 4400 lb. after a considerable enlargement of diameter.

(3) A piece of 4-in. 10 gauge cold drawn tube. This was subjected to 4200 lb. hydrostatic pressure without bursting but is materially enlarged in places.

(4) A piece of 4-in. 10 gauge cold finish tube. This burst under a hydrostatic pressure of 4200 lb. after a considerable enlargement of diameter.

(5) A piece of 4-in. 10 gauge Shelby cold finish tube. This burst under 4300 lb. hydrostatic pressure after a very appreciable enlargement of diameter.

(6) One piece Shelby seamless boiler tubing, 4-in. 10 gauge, flanged cold to $5\frac{1}{2}$ in. diameter. There is no sign of a break or a crack.

(7) One piece of Shelby seamless boiler tube, 4-in. 10 gauge, expanded cold to $4\frac{1}{2}$ in. diameter. There is no sign of a break or crack.

A number of Shelby seamless tubing exhibits, some of which are illustrated in Figs. 2 and 3, were as follows:

(8) One piece of seamless tubing, $1\frac{7}{16} \times \frac{9}{32}$ in. wall, upset to $2\frac{1}{8}$ in. wall, by $1\frac{1}{4}$ in. long.

(9) One piece seamless tubing, $\frac{5}{8} \times \frac{1}{4}$ in. gauge, expanded to $2\frac{1}{2}$ in. $\times \frac{3}{32}$ gauge for a length of $5\frac{1}{4}$ in. Note the enormous

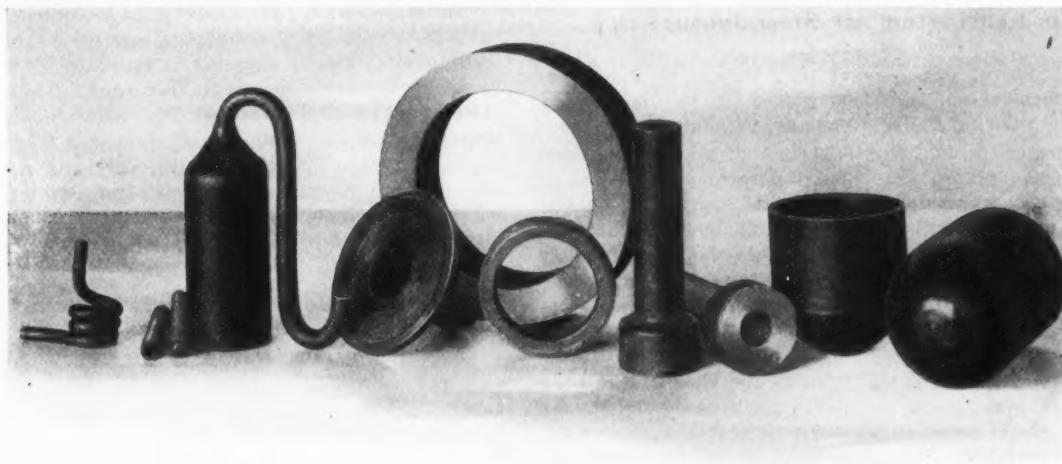


Fig. 2.—Shelby Seamless Steel Tubing, Partially Described in Paragraphs Nos. 8, 9, 12 and 15 of the Accompanying Article.

expansion. This piece deserves the attention of every visitor to the booth.

(10) One piece seamless tubing, 4 in., 10 gauge, by 3 in. long, hammered flat, cold, with no break or crack at the fold.

(11) One piece of seamless tubing, $2\frac{9}{16}$ x $\frac{1}{8}$ in. gauge, expanded to 4 in. by $\frac{5}{32}$ gauge, for a length of about $1\frac{1}{4}$ in.

(12) One piece of seamless tubing, 4 in., 10 gauge, showing one end spun down and closed.

(13) Four pieces of seamless tubing showing different finishes which have been applied to steel tubing—namely, nickel plate, copper plate, brass finish and oxidized finish.

(14) Various tensile test pieces cut from tube in various processes of manufacture, from billet to finished tube.

(15) Several short lengths showing heavy gauge seamless tubing varying from $\frac{1}{2}$ to $1\frac{1}{4}$ in. and from 3 to 9 in. diameter. Particular attention is called to these pieces, inasmuch as many are of the opinion that Shelby seamless tubing is made only in small diameters and light gauges. As a matter of fact, it is made up to 30 in. outside diameter and with thickness of wall up to $1\frac{1}{2}$ in. in the larger sizes.

(16) A dinner set made from Shelby seamless steel tubing.

(17) A chime of bells made from Shelby formed steel bells. Each bell represents a distinct note, and these are connected with a piano keyboard. This chime is about 10 ft. in height.

(18) Some special pieces. The illustration Fig. 3 clearly shows these shapes. They are made by inserting small pieces inside of larger pieces in varied designs. These are cold drawn in long lengths, and then cut off in the small sections shown. The various pieces are not held in place by any brazing or welding process, but simply by the cohesion resulting from the cold drawing of the entire section, and the reduction in diameter thereby obtained on the outer section, forcing the inner sections so close together as to resist the strain of cutting off in thin sections. None but the best grade of material uniformly used in Shelby seamless steel tubing would withstand such treatment.

(19) Four tables made entirely of seamless tubing. The tops are made from square tubing and the legs are gracefully bent into a shape to support the tops.

(d) Fittings and valves:

(1) A special case containing various patterns of gate valves, both iron body and brass; also sectional view of the iron body.

(2) Some specialties manufactured by the National Tube Company, including Kewanee ell and tees, Kewanee union swing check valves and Kewanee boiler couplings, also sample of Y valve in both brass and iron body.

(3) A full line of Kewanee unions in sizes from $\frac{1}{2}$ to 4 in., both black and galvanized, and showing various patterns, including the round end, octagon and male and female.

(4) A line of cast and malleable iron fittings. This embraces ell, tees, crosses, &c., for standard, medium pressure, extra heavy and hydraulic service.

(5) A line of valves and cocks, embracing globe, angle, gate and check valves for standard, medium pressure, extra heavy and hydraulic service. This includes an 18-in. standard iron body outside screw and yoke gate valve with flanged end, also a 12-in. extra heavy outside screw and yoke gate valve with bypass.

(6) Miscellaneous fittings, including well points and well supplies, malleable pipe clamps, double wrought strap pipe saddle, flanged end fittings, &c.

(e) Welded pipe. A number of pyramids showing different sizes of pipe from $\frac{1}{4}$ to 30 in. This includes samples of merchant, extra strong, line pipe, Matheson joint pipe, drive pipe, tubing, double extra strong pipe, casing and boiler tubes. Each type of tubular material is stenciled, together with its size.

A limited liability company, the Oesterreichisch-Amerikanisch Magnesit-Gesellschaft, with headquarters at Vienna, has been formed by Hugo Willisch of Koenigs-winter, Otto Briede of Benrath and Hessenbruch of Dusseldorf, to develop a magnesite mine at Millstatt, Carinthia, Austria.

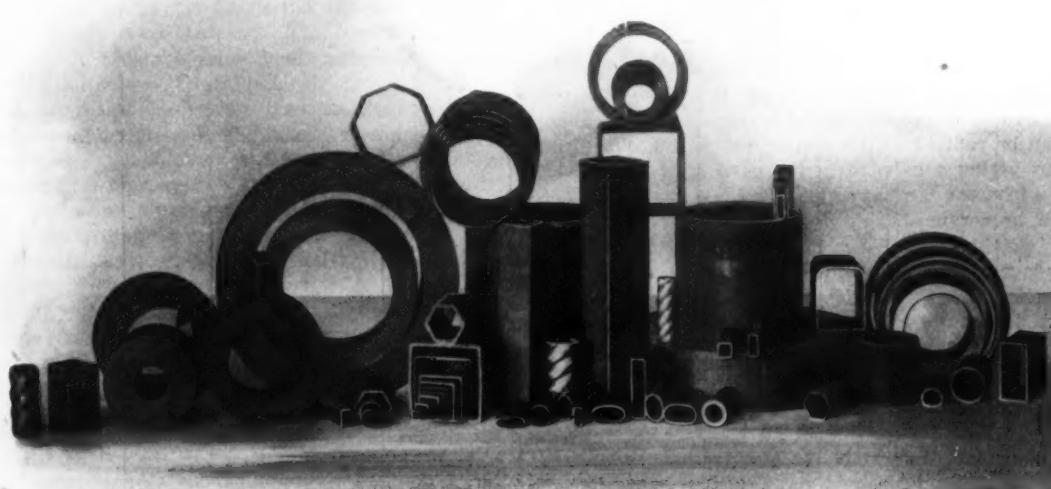


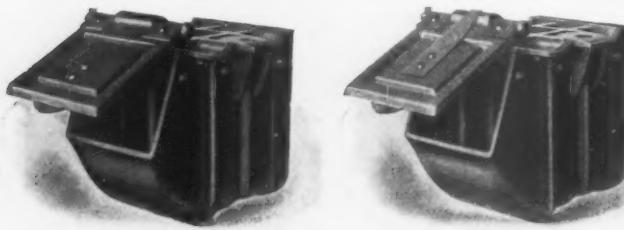
Fig. 3.—Various Pieces of Shelby Seamless Steel Tubing. Described in Paragraph No. 18.

The Kensington All Steel Journal Box.

An all-steel car journal box, known by the trade name Kensington, has been placed on the market by the Union Spring & Mfg. Company, Pittsburgh, Pa., manufacturer of coil and elliptic springs of all kinds, pressed steel spring plates, &c. The illustrations show two of these boxes, which differ only in that one has an outside spring on the cover and the other an inside spring.

The box consists of three pieces—the top, which is made of cast steel; the body, which is pressed from $\frac{1}{4}$ -in. plate, and the dust guard pocket, which is pressed from 3-16-in. plate, making it a strictly all-steel box. All rivets are $\frac{1}{8}$ in. diameter, and are driven by hydraulic pressure. The box is oil tight, as the back of the body is pressed solid to the full depth required by the Master Car Builders' Association, and no rivets are located below the oil line. The box is of M. C. B. dimensions throughout and will therefore take the M. C. B. lid, wedge, bearing and dust guard.

To make it a very rigid box, one that will not get out of square, even if the tie bar pull should become excessive, the cast steel top is provided with inside flanges, and the body has continuous corrugations running around its three sides. Additional precaution has been taken to relieve the rivets of excessive strain by



Two Patterns of the Kensington All Steel Journal Box Made by the Union Spring & Mfg. Company, Pittsburgh, Pa.

providing slots in the lower edge of the inside brackets, into which the pressed body is solidly driven. Along the top the sides are held in a similar way by lugs projecting from the top casting. These lugs, being located on each side of the corrugation, tie the latter firmly to the cast steel top at its extremities and impart its full stiffness to the box.

Shearing strain on the rivets is avoided by fitting the top of the box neatly against the top flange of the casting. The top casting contains all the bearing surfaces, and, since it can easily be gauged and ground before assembling, the frequent trouble of the wedge and bearing not going into place has been successfully overcome. This top casting also takes all the vertical, lateral and longitudinal strains which can come upon the axles, and being made of cast steel it is stronger to resist these strains than either a gray iron or malleable iron box.

Another former trouble, the breaking of the back of the box by side blows from the axle, has been eliminated, as the blow that would break a gray or malleable iron box would only dent the back of this box. If from a derailment the body of the box should become so distorted that it could not be straightened out, a new body can be refitted to the casting by cutting out 10 rivets, thus giving a salvage in the casting of about \$1.25 per box, whereas, an entire cast or malleable box would have to be scrapped.

The weight of the $5\frac{1}{2} \times 10$ in. box is 80 lb., with the lid in place, which is considerably less than that of the regular M. C. B. box, which weighs 132 lb., or the malleable iron box which weighs from 105 to 110 lb. The Kensington all-steel box therefore saves considerably in the dead weight per car.

The Fillmore Avenue Foundry & Iron Works, Inc., 153 Fillmore avenue, Buffalo, N. Y., has secured the contract to build the melting furnaces and annealing ovens for the new plant of the Torrance Malleable Iron Company,

Voorheesville, N. Y. This plant is to be equipped entirely with the improved Truesdell system for annealing and melting iron, and is expected to be ready to take off a heat about November 1. H. Truesdell, mechanical engineer, has entirely severed his connection with the Cyclone Grate Bar Company, Buffalo, which now has no rights to use the Truesdell system. He is associated with the Fillmore Avenue Foundry & Iron Works, Inc., of which Lyman P. Hubbell is president and Chas. T. Wallace secretary and treasurer.

Ten Torpedo Boat Destroyers Contracted For.

Secretary of the Navy Metcalf, on September 20, awarded contracts for the construction of 10 torpedo boat destroyers as follows: Two boats each to the Fore River Shipbuilding Company, New York Shipbuilding Company, Newport News Shipbuilding Company, Bath Iron Works and Wm. Cramp & Sons Ship & Engine Building Company. The contracts to the Fore River and the Cramp plants are for the construction of vessels on their own plans for hull and machinery; the contracts to the other firms are for the construction of the vessels on the Department plans.

The amounts of the several contracts are as follows: Fore River Shipbuilding Company, company's plans for machinery, \$610,000 each; Newport News Shipbuilding Company, Department's plans, \$620,000 each; Bath Iron Works, Department's plans, \$644,000 each; William Cramp & Sons Company, company's plans, \$664,000 each, and New York Shipbuilding Company, Department's plans, \$665,000 each.

The Department's plans and specifications were for vessels of about 742 tons displacement, the hull and machinery being designed for a guaranteed speed of $29\frac{1}{2}$ knots, giving bidders at the same time the option to submit plans of their own machinery. Cramp & Sons will construct 30-knot boats and the Fore River Company $29\frac{1}{2}$ knots with their own plans for machinery.

Customs Decisions.

Machinery Imported for Vessel Repairing.

The Board of United States General Appraisers, in denying the contention of Moral & Co., of Porto Rico, laid down the rule last week that machinery brought to the United States from a foreign country to repair a vessel lying disabled in an American port must be regarded as "imported merchandise" within the meaning of the tariff act and as such subject to duty. The test case was brought because of the action of the Government in assessing duty on certain parts of machinery used in repairing the steamship Buenos Ayres, a Spanish vessel, lying in the harbor of Mayaguez, Porto Rico. It appears from the testimony placed before the board that the steamer had become disabled at sea and was towed into the harbor for necessary repairs. The parts necessary for repairing the machinery of the Buenos Ayres were brought into the harbor of Mayaguez by the Pathfinder, a vessel owned and operated by a line other than the company owning the Buenos Ayres.

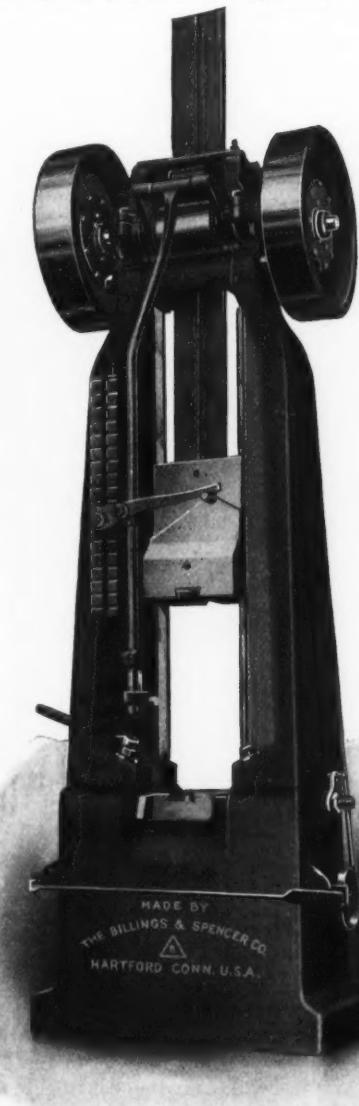
In denying the importer's contention, General Appraiser Hay, who writes the decision for the Board, says that machinery brought to the United States from a foreign country to repair a vessel lying disabled in one of the American ports must be regarded for the purposes of duty as "imported merchandise." According to Moral & Co., free entry should have been granted because the machinery was not actually imported. Mr. Hay, on the other hand, takes the position that every commodity having a value brought within the limits of the United States is "imported merchandise" within the meaning of the customs law. The general appraiser makes the further point that machinery transferred without the supervision of customs officers from a foreign vessel of one line to a vessel of a different line is not entitled to exemption from duty under section 17 of the act of March 3, 1897. Mr. Hay quotes a number of authorities in support of his ruling.

The Billings & Spencer Model C Drop Hammer.

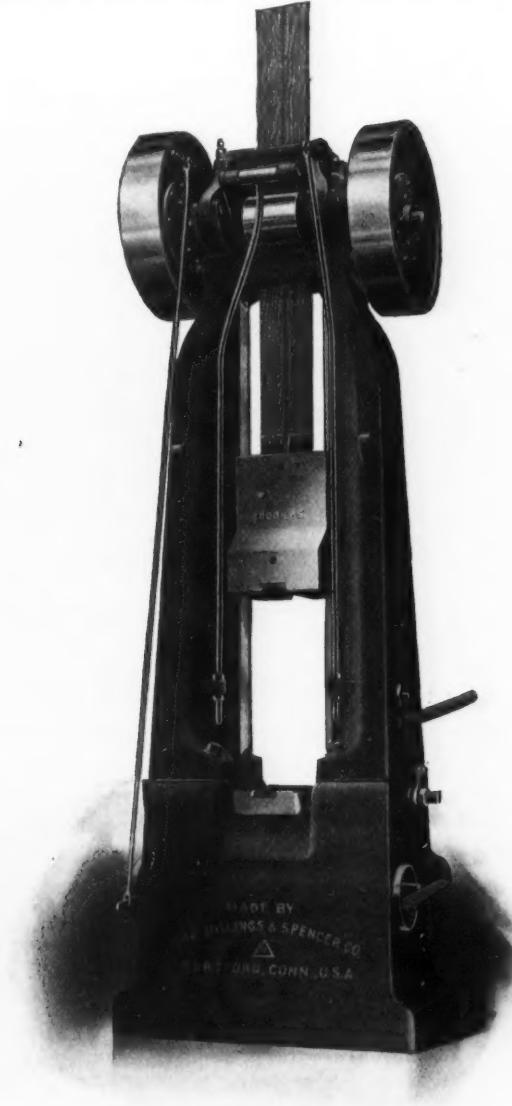
Drop forging has been a specialty of the Billings & Spencer Company, Hartford, Conn., for about 40 years, and during half of that time the company has been manufacturing its own drop hammers. The first hammer was known as the model A. Later further improvements were made and new features adopted which resulted in the model B drop hammer. Recently the demand for much heavier work, and a correspondingly greater efficiency in the forging plant, prompted the company to consider further possible development, and for the past

front friction roll. The two rolls with their eccentrics are, therefore, interchangeable. By this means of adjustment a true alignment between the lifting board and rolls is always preserved. A new form of bronze bushing is introduced on the eccentric bearings, which is easily and quickly removed and replaced. The same manner of adjustment, namely, an eccentric, is also employed on the rear board clamp. These adjustments of the rear friction roll and rear board clamp are made by means of bars attached to the eccentrics and running down parallel to the uprights to within easy reach of the operator on the floor, as may be seen in the rear view of the hammer herewith. An improved method is also employed in attaching the head to the uprights.

The uprights used on the new model are of special



FRONT VIEW.



REAR VIEW.

The New Model C Drop Hammer Made by the Billings & Spencer Company, Hartford, Conn.

few months a new model has been undergoing a severe test in the company's drop shop.

The new machine, known as model C, is not only much stronger than the old, weight for weight, but it incorporates several distinctive features. An improved board clamp catch up is employed which does away with the latch and connections at the side for holding the ram aloft. This board clamp is of an entirely new design and is located at the extreme top of the machine above the friction rolls, or lifting device. In this position it is impossible for oil to get between the clamps and board, which has heretofore been the cause of much inconvenience where board clamps have been used. Positive action is assured in the new clamps by the operation of cams or eccentrics controlled by a foot lever attached to the base of the machine. Another very important feature lies in the novel adjustment of the rear friction roll by means of an eccentric, a duplicate of that used in engaging the

design and will greatly reduce the possibility of breakage. The distribution of metal is such as to afford the maximum of strength. The cross section of the uprights is that of a letter V, the apex forming the guide for the ram. A longitudinal rib running its entire length adds strength to the upright. An important feature in the construction of this machine lies in the fact that the uprights remain solid throughout their lengths, no weakening perforations being necessary in the placing of attachments. A new lateral adjustment for the uprights is employed at the junction of the base and uprights, which is considered a marked improvement on anything heretofore used.

The releasing lever attached to the outside of the left hand upright, as shown in the front view, has an improved adjustment. This adjustment is in the form of a modified rack, which allows the ram to be released at any desired height within intervals of $1\frac{1}{2}$ in.

The Wikstrom Hydraulic Tube Tester.

The strength of tubes and pipes to resist bursting is determined by applying an internal hydraulic pressure. Many machines are built for such testing, but they are generally so arranged that part of the tube or pipe to be tested is hidden by the tension bars and water receiving trough of the machine itself, which hampers a close inspection of the tube. The necessary tightening end pressure on the tube when applied by hand through a wheel and screw, as it generally is in the smaller machines, is laborious. In the larger machines hydraulic pressure is sometimes employed, but since the end pressure required for a small tube is less than that required for a big one, *e. g.*, the end pressure for a 6-in. tube would buckle a 2-in. tube, some makers have introduced a hydraulic pressure regulating valve to adjust the end pressure. Even this, however, has not proved altogether satisfactory, since it is sometimes necessary to adjust the end pressure somewhat for each tube and for old and new packings, and so much manipulation of a regulating valve is slow, uncertain and bothersome.

The above objections appear to have been overcome in the machine shown in the accompanying drawing, and designed by Malcolm Wikstrom, Storfors, Sweden. All parts of the tube are visible and accessible during the test, the tension bars *a* and *c* being placed above and

below the tube, instead of on the sides. The end pressure is applied by hydraulic pressure through the cylinder *b*, and to vary this pressure, in place of a reducing valve there is arranged an adjustable spring cushion, *d*, by which the end pressure almost immediately can be varied from nothing to any pressure required. This is accomplished in the following manner:

The tube *e* is rolled into the machine and rests on supports (not shown), which hold it in the position shown in Fig. 1. The water under testing pressure is then turned into the cylinder *b*, moving the piston *f* forward. The length of the stroke of this piston is fixed, and in Fig. 2 the position of the different parts is that when the piston *f* has completed its stroke. The tube ends are then closed up by packing disks *g* and *k*. The distance, *x*, can be adjusted by the hand wheel *h* and screw *j*. If this distance is made equal to the length of the stroke of the piston *f*, then turning on the water in the cylinder *b*, Fig. 1, would cause the piston *f* to travel the full length of its stroke without hardly touching the tube, and consequently there would be no end pressure at all on the tube. If the distance *x* is made equal to half the stroke of piston *f*, again turning on the pressure in cylinder *b* will cause the piston to move forward until it struck the end of the tube, then it would squeeze the tube between the packing disks *g* and *k* and compress the spring cush-

ion *d*. The amount of this compression determines the end pressure on the tube, and as this amount depends on the distance *x*, which is adjusted by the hand wheel *h*, it is clear that end pressures from nothing up to the full capacity of the springs can be obtained. The springs are designed for a capacity equal to the total hydraulic pressure on piston *f*.

The spring cushion *d* rides on a carriage, *m*, which can run the whole length of the water receiving trough *n*, so as to accommodate tubes of different lengths. Small differences in length can be taken care of by the screw *j*. A bolt, *o*, which fits in holes in the tension bars *a* and *c* locks the carriage in any position required. The spring *p* pulls back the piston *f* when pressure is released in the cylinder *b*. The testing pressure for the tube is admitted at *q*, through valves not shown, and the air in the tube escapes at *r*, through a valve not shown.

The number of tubes that can be tested in a given time on this machine is claimed to be greater than on other machines with the same number of attendants, thereby reducing the cost of testing. This will be particularly an advantage in mills making a variety of sizes and lengths of tubes, and where on this account resetting of the testing machine often takes place.

New Chilian Naval Contract.—In the latter part of July the President of Chile signed a decree appointing

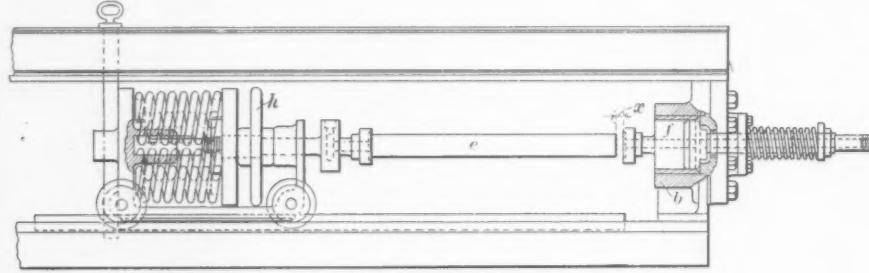


FIGURE 1

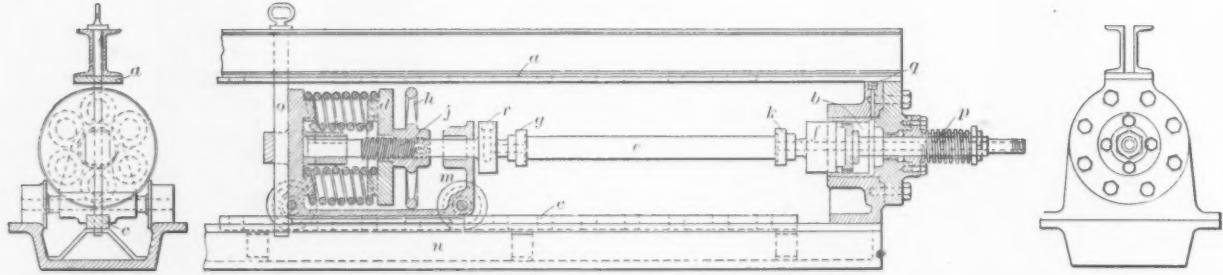


FIGURE 2

Details of the Hydraulic Tube Testing Machine Designed by Malcolm Wikstrom, Storfors, Sweden.

below the tube, instead of on the sides. The end pressure is applied by hydraulic pressure through the cylinder *b*, and to vary this pressure, in place of a reducing valve there is arranged an adjustable spring cushion, *d*, by which the end pressure almost immediately can be varied from nothing to any pressure required. This is accomplished in the following manner:

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Morrison & Co., Valparaiso, Chile, a well-known firm of importers and engineers, sole suppliers to the Chilian Navy for a period of five years, the contract covering practically every item of supplies of all kinds that may be called for. Morrison & Co. have expressed their intention of giving American manufacturers every opportunity to figure upon all their requirements in this connection. William E. Peck & Co., 116 Broad street, New York, are agents for Morrison & Co. in this country. It would be well for manufacturers and dealers in supplies likely to be of interest in connection with this contract to put themselves in communication with Peck & Co.

Mexico and Alien Mine Owners.—A press telegram from the City of Mexico, dated September 18, states that Vice-President Ramon Corral has written a letter to an officer of a New York mining company operating in Mexico replying to questions in regard to the proposed mining law. Mr. Corral says in his letter that the anti-foreign provision of the bill which has aroused such a storm of protests on the part of foreign mine investors in Mexico will be eliminated, and that the law when passed finally by the Mexican Congress will contain nothing inimical to foreign capital already invested or that may be seeking investment in that country.

The Clark All-Steel Box Car.

A design of all-steel box car is being offered by the Clark Car Company, Frick Building Annex, Pittsburgh, Pa. In this car it was the purpose to combine as many functions as possible in each piece, so as to minimize the number of pieces and connections. The side and end walls are in effect plate girders, so that no separate framework is required. Vertical stiffeners are supplied at intervals, as they would be in large plate girders. The web instead of being continuous is divided horizontally about midway, the lower plate being heavier than the upper plate to provide extra strength in the part most likely to receive injury from shifting loads or careless handling. In the upper section such heavy plate is not required, and the use of a lighter plate allows the car as a whole to be that much lighter.

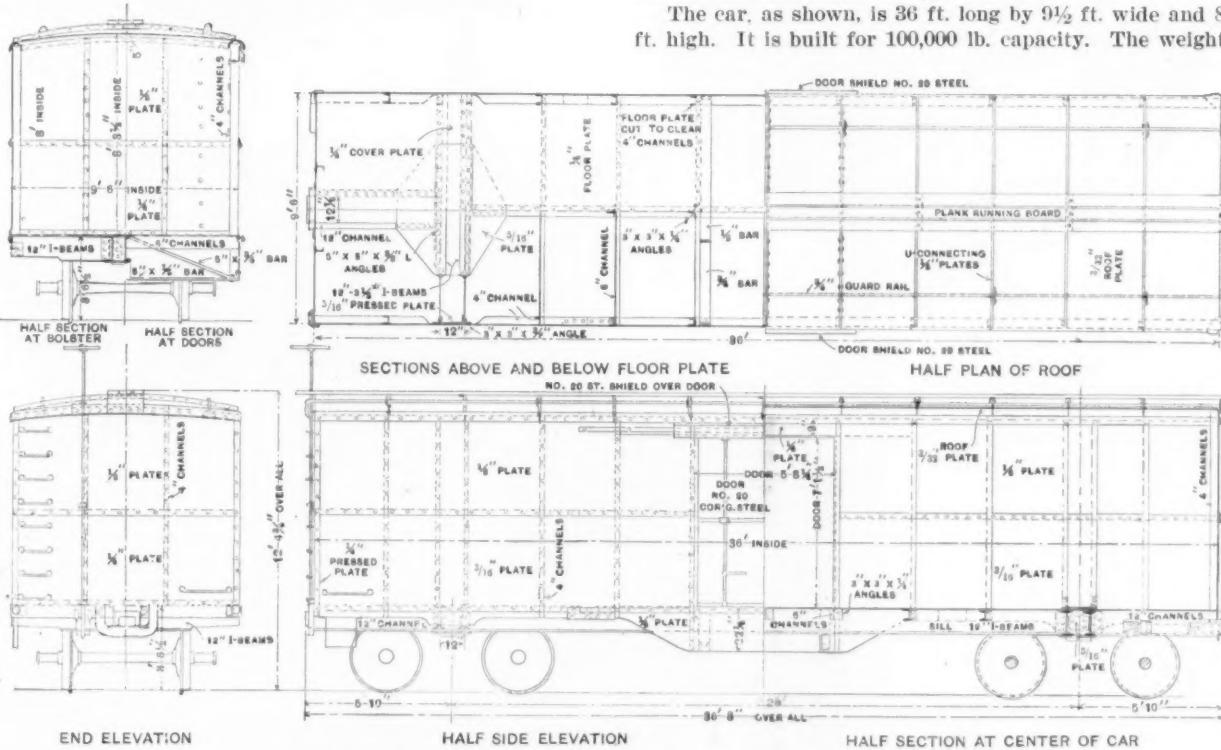
An important feature of the car, which can be appreciated from the accompanying illustrations, is that all members are so riveted and lapped as to exclude water, making the interior entirely waterproof, without depending on tightness in the joints and around the riv-

The roof is made up of sheets running crosswise of the car and flanged upward at their intersection to form outside carlines, leaving clear head room inside of the car. The upturned edges of the roof sheets are higher at the center than at the sides, which makes the carlines stronger for the support of the roof load. The ends of the roof sheets are flanged downward from the eave strut, and are fastened by the rivets which connect the strut to the side sheet. The running plank is connected directly to the carlines, as are also the guard rods on the roof near the sides of the car, running from end to end, and no holes are made through the roof which might give rise to leakage.

The doors are made of corrugated iron laid crosswise, and bound across the top and on the sides by a light pressed channel section. The bottom section of the door is a pressed Z-shape, so as to shed water. This door can be made up to weigh about 150 lb., which is lighter than the wooden doors now in use.

The under frame of this car is made of a single beam through the center between the bolsters, and 6-in. channels running from this central beam to the side sills. The floor sheets are $\frac{1}{4}$ in. thick.

The car, as shown, is 36 ft. long by 9 $\frac{1}{2}$ ft. wide and 8 ft. high. It is built for 100,000 lb. capacity. The weight



The All-Steel Box Car Patented by the Clark Car Company, Pittsburgh, Pa.

ets. In the roof, for example, there are no holes which project into the car, the plates forming the roof being riveted together by upturned flanges and surmounted by a U section through which the rivets pass horizontally; these joints also form the carlines of the roof. In the floor the riveting is done in such a manner that no rivet heads project anywhere through the surface where they would interfere with shoveling, and the doorway is made entirely clear.

A feature that is very desirable in the maintenance of these cars is that all parts are so assembled that any piece may be removed by cutting the rivets of that piece only, and no other parts of the car will be involved in the repair. In general this is accomplished by forming the sides of horizontal sheets extending from the end to the center, and stiffening these on the cords by an eave strut at the top, and by attaching the lower edge of the sheets to the side sills and floor plates. The stiffeners, which are placed vertically at intervals throughout the length of the car, are framed through the floor sheets at the bottom to the side sills and floor beams. The sheets below the seam that runs laterally of the car about 4 ft. above the floor are 3-16 in. thick, and the upper sheets $\frac{1}{4}$ in. thick. The same general construction is employed on the ends, except that the lower sheet is $\frac{1}{4}$ in. thick to withstand the effect of shifting loads.

of the car is 38,000 lb., of which the weight of the trucks is 16,400 lb.

The Union Pacific Railroad has been carrying on experiments with all-steel box cars manufactured in its own shops. The published statements concerning these cars indicate that they have been used in various classes of service and that there have been no objections to their use by shippers whose freight has been handled in them. These two cars have been in service on the Union Pacific Railroad and also on the Southern Pacific Railroad over the desert country where the temperature is sometimes as high as 130 degrees.

Comparison of the cost of all-steel box cars and composite steel and wooden box cars of the same capacity indicate that the steel box car can compete in cost with the composite car. The amount of shop work on the Clark car compares favorably with the average gondola or hopper car, and it will be seen that the weight of the car is about 4000 lb. less than for 100,000-lb. gondola cars, and about the same weight as 100,000-lb. hopper cars. The Clark Car Company is prepared to offer this car in competition with composite box cars.

A comparison of the repairs required on wooden gondola cars and steel gondola cars has frequently been made to the great advantage of the latter. If a comparison of the repair cost of all-steel box cars with

wooden box cars were made it would undoubtedly show an even greater advantage in the saving of repairs, for the reason that shippers misuse box cars in loading and unloading freight more than they do gondola cars, owing to the greater variety of freight for which they are used and its character. For instance, a load of lumber if poorly stored in a box car will break out the ends by shifting. In fact, a great many classes of box car freight act in this way. The difficulties now encountered with leaky roofs for box cars have been taken into consideration in the design of the roof of the Clark car, it being



Fig. 1.—Stationary Form of Pyrometer Indicator.



Fig. 2.—Complete Thermo Couple and Couple Removed from Protecting Tube.



Fig. 3.—Portable Pyrometer Ready for Use.

so constructed that there are no seams or joints which can open up.

Poetter & Co., Ltd., a Dortmund, Germany, engineering company, issues from its London office, 39 Victoria street, Westminster, a catalogue, in English, devoted to a recapitulation of the various contracts the firm has undertaken in the construction of metallurgical works. There are 77 pages, $5\frac{1}{2} \times 8\frac{1}{2}$ in., including 36 full page illustrations of plants erected or equipment installed by Poetter & Co. These include blast furnaces, steel works, annealing and heating furnaces, wire mills, gas producers, gas power and by-product recovery plants. The impression given by these views is of the advanced character of the equipment in many German iron and steel works, and the incorporation of features paralleling the best practice in the United States, while in gas and by-product recovery plants, it need not be said, these German works set the pace.

In the stationary form, the Brown electric pyrometer consists of a large switchboard-type millivoltmeter, calibrated to read directly in degrees of temperature (either Fahrenheit or Centigrade), a thermo-couple which is inserted in the heat to be measured, and the leads or wiring for connecting the thermo-couple to the indicator, which can be practically any length desired. The large size of the millivoltmeter admits of an exceptionally long scale with large figures, which can be easily read at a distance. Where an instrument is required that can be readily carried about, the portable indicator, Fig. 3, is supplied.

The thermo-couple is the part of the pyrometer, which is inserted in the heat, and consists of two wires of different metals, welded together at one end, insulated from each other, and protected. When the junction of the two alloy wires is heated, a small current of electricity is produced, the intensity of which is proportional to the difference in temperature between the cold and hot ends

of the couple, and therefore gives a direct reading on the millivoltmeter. For measuring excessively high temperatures, the thermo-couple can be constructed of heavy nickel and tungsten alloy wires, having a fusing point of 2700 degrees F. This form of couple, however, is not recommended for such high heats, the platinum-rhodium thermo-couple being much more durable and constant in its indication at very high temperatures. The wires of the thermo-couple are insulated by small fire clay tubes and mica washers, serving to hold the wires in the center of the protecting tube. The great advantage of this insulation is that it will stand 3000 degrees F. or 1600 degrees C. without damage, and is quite inexpensive. For protecting the thermo-couple, steel tubes are generally used up to 1600 degrees F., while for temperatures above this, tubes of porcelain, quartz, firebrick and graphite are preferable, and each kind of tube has its advantage for certain uses. Where instantaneous temperature measurements are required, as of molten metals, an unprotected thermo-couple is supplied, heavy in construction and especially designed for quick readings.

The Brown thermo-couple has been constructed on new lines, using a hardwood lignum vite head with brass binding posts for connecting the wires or leads from the indicator. The hardwood head has four screws passing through it, as shown in Fig. 2, which hold the protecting tube. These protecting tubes are all furnished with

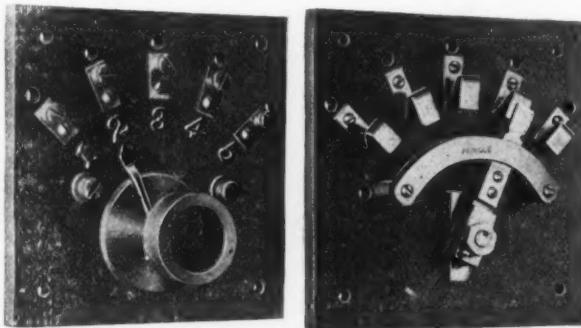


Fig. 4.—Front and Back of the Switch Furnished with Brown Pyrometers.

flanges with holes drilled and tapped exactly uniform, so that a new protecting tube can be ordered at any time, and by removing the four screws the old tube can be replaced. Where iron protecting tubes are used, an adjustable flange is supplied on the tube, so that the thermo-couple can be inserted readily any desired length into the furnace, and this flange prevents the couple falling all the way into the furnace or oven. The insulation of the thermo-couple will withstand practically any temperature, and is an advantage under severe conditions. The thermo-couples are made long enough to keep the cold junction at about room temperature, and the indicator is calibrated with the pointer at 77 degrees F., room temperature.

An advantage of an electric pyrometer is that a number of thermo-couples may be connected to one indicator through a multi-point switch by turning the handle of which the temperature of any of the furnaces or metal baths can be independently and successively read on the one indicator. A switch is supplied with the Brown electric pyrometer working on the knife switch principle, which is absolutely positive in its action, and with which poor contacts cannot occur. As shown in the rear view of the switch in Fig. 4, the switch blade has two leaves which straddle each contact point. It has the advantage over the ordinary knife switch, in that only one handle has to be turned to any of the numbered points, and it is impossible for more than one thermo-couple to be connected to the indicator at a time, which might happen where a number of knife switches are used. Switchboards at present in use with electrical pyrometers give more or less trouble as the switch becomes worn. With some switches it is possible to get readings on the pyrometer, varying as much as 200 degrees and due entirely to the character of the contact made by the switch.

For blast furnace work, a specially designed thermo-couple is inserted in the bustle pipe, and one in the top of

the dustcatcher for gas temperatures. These can be connected either to individual indicators, or to one indicator through a switch, and a recorder can also be connected to the same couples to record the temperature in the superintendent's office. This pyrometer has proved desirable at blast furnaces, also in connection with iron stoves, one couple being used for each stove, one on the bustle pipe and one on the dustcatcher, and all connected to an indicator through a switchboard.

For measuring the temperatures in annealing, hardening, tempering and other furnaces and ovens, the pyrometer is particularly suitable, regardless of the fuel used, whether it be coal, oil or gas. Similarly it may read the temperatures of metal baths using lead, barium chloride or other salts.

Accurate temperature measuring instruments are very desirable, also in connection with tinning and galvanizing. With this pyrometer 20 tinning pots can be connected through a switchboard to an indicator in the office, where the temperature of every pot in the tin house can be noted in a few minutes, and the cost of the necessary apparatus is moderate.

Probably the highest sustained temperatures are those found in glass works. Brown electric pyrometers are at present in use on glass melting tank furnaces where the temperature is 2750 degrees F., and when checked up with a portable Le Chatelier pyrometer, have shown no error in their readings. A pyrometer which will stand such severe conditions is certainly capable of measuring the ordinary temperatures usually found in industrial works, and a practical pyrometer inexpensive in first cost and maintenance is greatly to be desired.

The Increase in Mexican Iron and Steel Duties.

The Department of Commerce and Labor, in a recent bulletin, gives the change in the Mexican tariff last promulgated and in most cases made effective August 16, 1908. Those affecting the iron and steel trade were referred to in these columns in advance of the issuing of the President's decree. The exact classifications of the articles on which changes are made are shown in the following:

	Rate of duty.—		
	New. Pesos.	Old. Pesos.	
Steel in bars, round, square, flat, channel, in an octagonal or hexagonal section, or cruciform; 100 kilos, gross.....	6.00	5.50	
Steel in bars, of all forms and sections, with designs, channels, indentations, or wrought in symmetrical designs on its entire surface, or only part thereof; 100 kilos, gross.....	7.00	5.50	
Iron in bars, of all forms and sections, with designs, channels, indentations, or wrought in symmetrical designs on its entire surface, or only part thereof; 100 kilos, gross.....	7.00	6.00	
Rails of iron and steel for railroads,* and switches,† disks,† sleepers,† and frogs;† 100 kilos, gross.....	2.50	2.00	
Screws, bedplates, attachments and bolts, of iron or steel for attaching rails; kilo, gross.....	0.05	0.01	
Beams and joists of iron or steel, when not specially perforated or slotted; 100 kilos, gross.....	3.50	3.00	
Beams, joists and columns of iron or steel, when specially perforated or slotted; frames, brackets, base plates for columns, butt or connecting plates, braces or tie beams with or without nuts, and other parts, not specially mentioned, of iron or steel, for construction purposes; kilo, gross	0.05	0.04	

* The old duty was 1 peso per 100 kilos on rails weighing not more than 10 kilos per lineal meter and 2 pesos on those weighing more than 10 kilos.

† The old duty was 1 peso per 100 kilos.

The duty on cement and Spanish white was increased from 0.55 peso to 0.70 peso per 100 kilos, and benzol, which had paid 0.09 peso per kilo, was put on the free list.

Owing to the Attorney-General's decision that their action was unlawful, the 56 national banks in Oklahoma (out of a total of 309) which accepted the provisions of the State law for guaranteeing deposits are now required to withdraw from the agreement. A bank's refusal to do this will be regarded as just cause for the forfeiture of its charter.

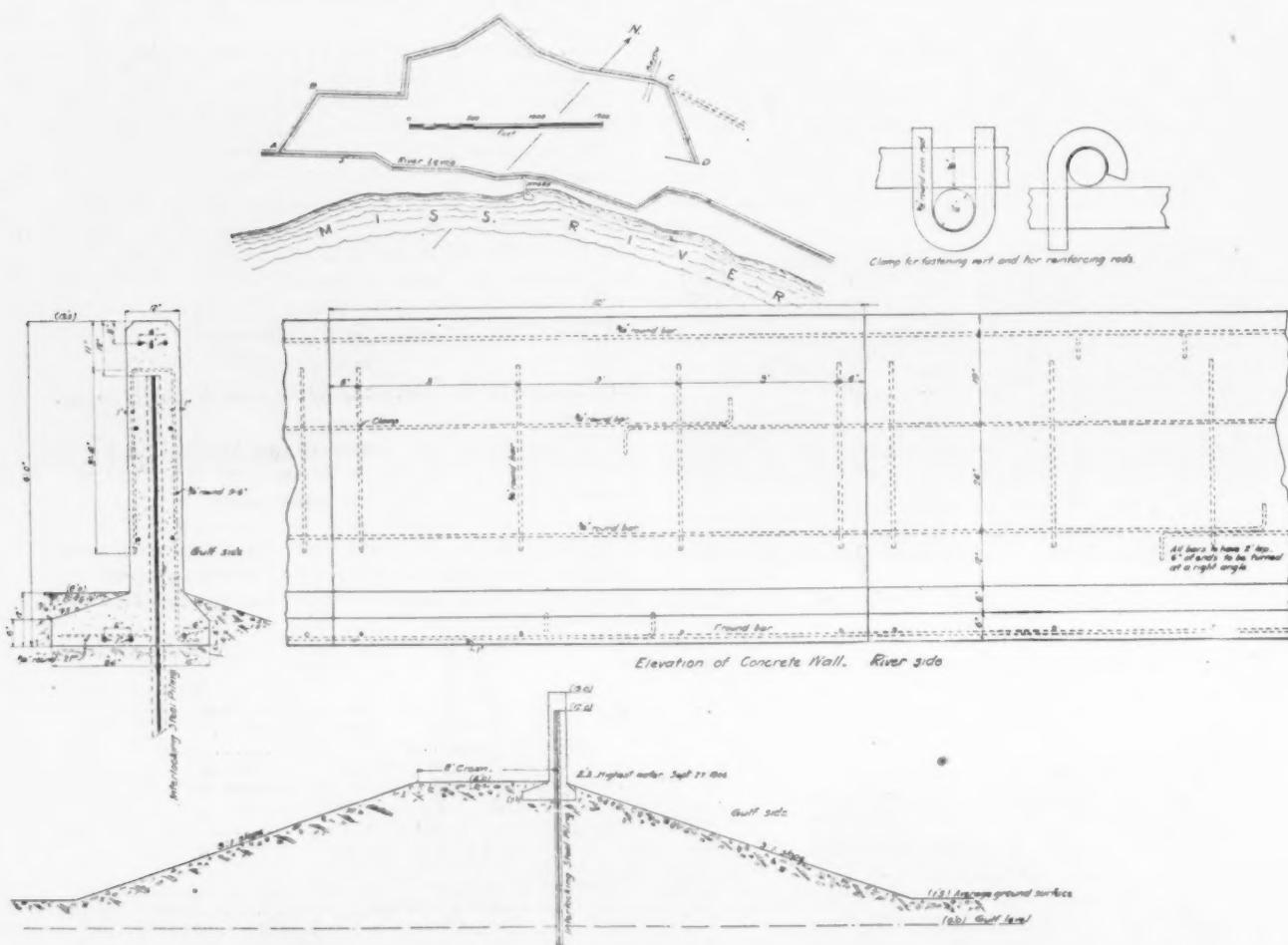
The Carnegie Steel Sheet Piling. Used in the Fort St. Philip Sea Wall.

Fort St. Philip is on the left bank of the Mississippi River, about 74 miles below New Orleans, 34 miles from the Head of Passes and about 47 miles from the jetties at the mouth of the river. With Fort Jackson on the right bank of the river, it constitutes the outer defense of the city of New Orleans, and is famous for its resistance to the fleet of Captain Farragut and its final capture in 1862 by the Federal forces. Fortifications were first erected in 1793, and were rebuilt in 1895, 1896 and 1897, the present equipment consisting of a battery each of 6, 8 and 10 in. guns.

While quite a distance from the mouth of the river, it is only about 1 mile from Breton Sound, which is an arm

14 ft. into the levee, and extending 5 ft. above its top. The piling was specified not to be less than $\frac{3}{8}$ in. thick, to be driven vertically and in straight lines from angle to angle of levee. Twelve-inch 35-lb. United States steel sheet piling was chosen as being peculiarly fitted for the work in hand and 4476 pieces were driven, weighing in all 1508 net tons.

Work was begun December 1, 1907, and after the enlarged and newly built levee had settled sufficiently, the driving of piling was commenced. The piling was shipped by barge on the river, the first lot arriving in March and the second in May. The piles were driven by a drop hammer weighing 2800 lb., with which was used a cushion hood, which wholly prevented any battering of the ends. The drop of the hammer was 10 ft., and the average number of blows was eight. While the soil was practically all silt, several obstructions were encountered and found to be live oak stumps buried underground,



The Engineer's Plan of the Fort St. Philip Sea Wall.

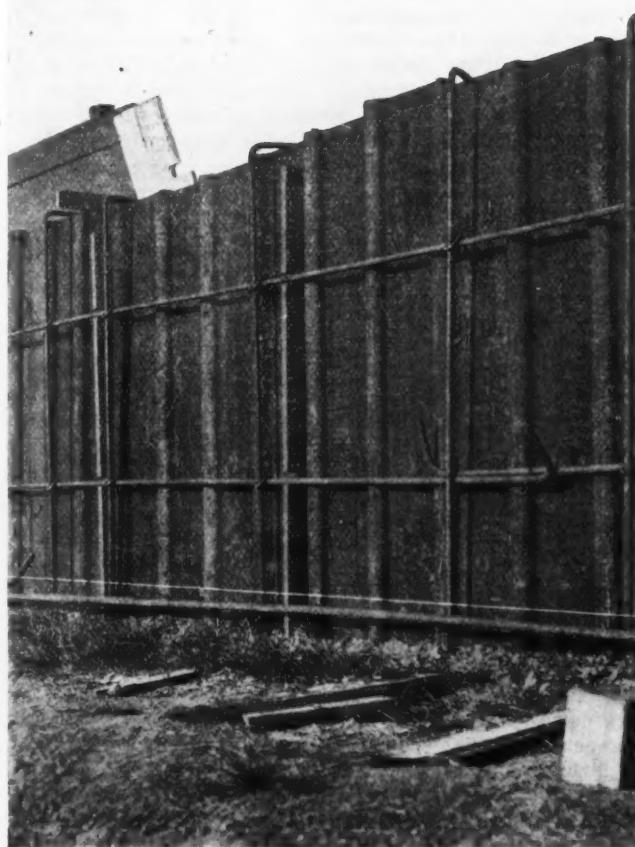
of the Gulf of Mexico. The surrounding country is marsh land, frequently flooded by the backwater of the gulf. The river levee gives the fort ample protection at all times from high water in front, but to protect the fort on the back, or gulf side, from the seepage or backwater, which is especially dangerous at high tide and particularly so at storm tides, it was found desirable to construct a more stable and permanent sea wall than is afforded by the earth levee. It was accordingly decided by the War Department to convert the levee on the gulf side into a sea wall by extending it and raising it to a net elevation of 8 ft. above the gulf levee; and to prevent the seepage of the sea water, the plans of the engineers called for a reinforcement of the levee with a row of interlocking steel sheet piling with its top capped by concrete.

The length of the sea wall is 4400 ft., and the contract involved the enlargement of 3670 ft. of old levee, the building of 730 ft. of new levee, the driving of 4400 linear feet of steel sheet piling and the placing of the reinforced concrete. The steel piles were 19 ft. long, driven

through which the piling was driven without much difficulty. But one pile driver was used, and new high records in the driving of steel sheet piling were made; the minimum number of piles driven per eight-hour day was 113, and the maximum 281—a record for driving unprecedented in the history of the steel sheet piling industry.

As above mentioned, the object of the steel piling curtain wall was to prevent seepage into the reservation from the gulf side, and it was, therefore, necessary that this wall be made water tight. Under ordinary conditions, United States steel sheet piling can be made practically water tight by wooden packing strips driven with the piling; but in order to avoid the possibility of leakage, the specifications required all piles to be heavily coated with asphaltum pitch and this coating to be thoroughly dry before the piles were driven. After the piles were driven, the voids in the interlock were filled with grout composed of 3 parts of sand and 1 part of cement, the result of which was to make an absolutely impervious structure.

The 5 ft. of piling projecting above ground was



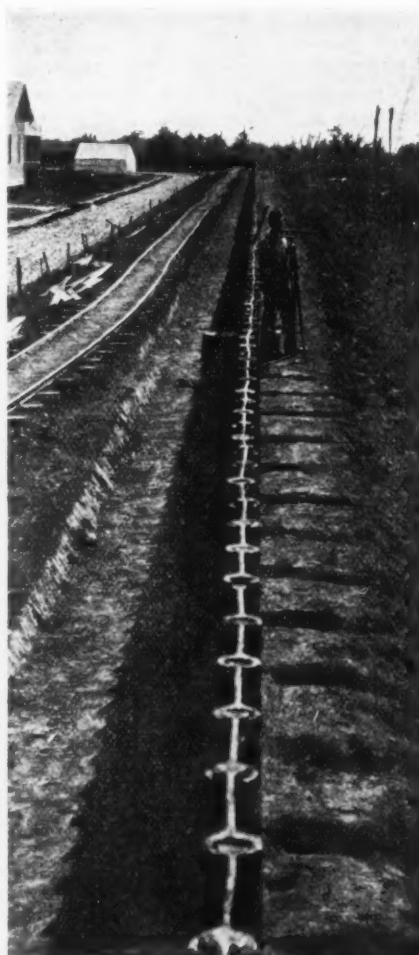
The Steel Reinforcement.



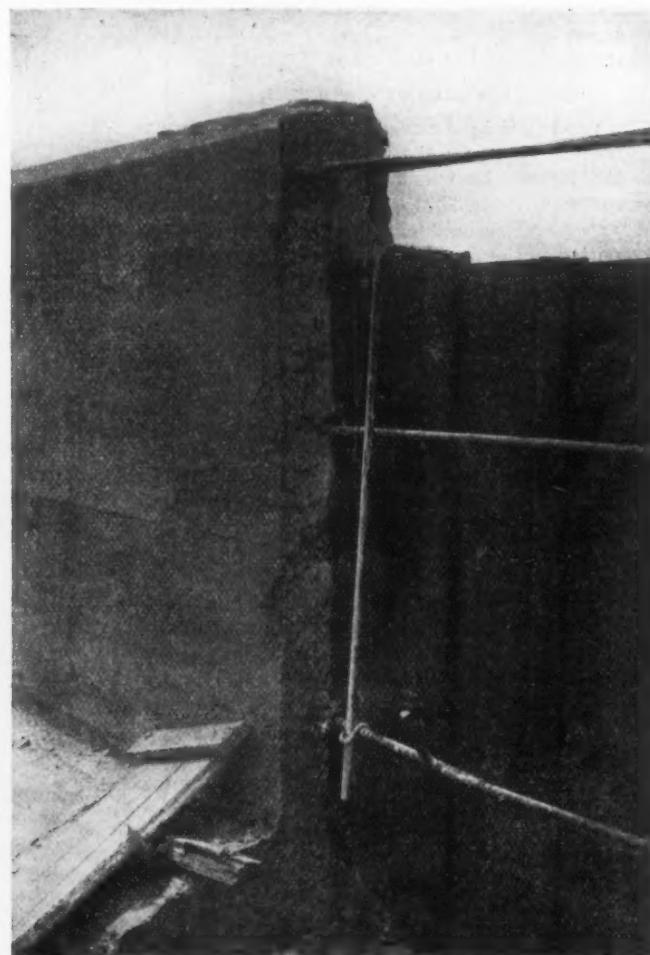
Concrete Forms in Position.

capped with concrete made in blocks 10 ft. long. Reinforcement was of plain round steel bars, showing an ultimate strength of 60,000 lb. per square inch and an

elastic limit of not less than one-half the ultimate strength. Vertical and horizontal reinforcing rods were securely fastened with clamps. The cement used was



The Piling Core.



Detail of Reinforcement.

furnished by the Universal Portland Cement Company, and the concrete was composed of 1 part cement, 3 parts sand and 5 parts of gravel or broken stone. The concrete forms were so constructed as to give a perfectly smooth surface, and no plaster or outside covering was allowed to be applied to the concrete surface after removal of forms.

The contract for the entire sea wall was awarded by Col. E. H. Ruffner, Corps of Engineers, to Richard M. Murphy of New Orleans, and the work was executed under the direct supervision of Richard Quinn, assistant engineer, and after his transfer to Cavite, under the supervision of John L. Dickey, assistant engineer. The steel piling was furnished by the Carnegie Steel Company, Pittsburgh, Pa., and the work, as a whole, was finally accepted by the Government on August 1. The photographs herewith reproduced show various stages in the construction of the wall, and are good evidence as to the simplicity of the construction, the perfection with which the work was executed and the satisfactory character of the installation. The Carnegie Steel Company manufactures and sells not only the United States steel sheet piling, but also the Friestadt interlocking channel bar piling in a range of weights adapted to all conditions of service.

Tariff Revision Plans.

WASHINGTON, D. C., September 22, 1908.—The Senate Finance Committee has decided that no consideration will be given at this time to the revision of the rate schedules of the Dingley Tariff act, and it is authoritatively announced that the subcommittee on tariff rates, of which Senator Hopkins of Illinois is chairman, will hold no executive sessions, and will grant no hearings until after the elections, and that in all probability this subcommittee will limit its work to the gathering of data, and will not attempt to draft tariff schedules until the bill to be framed by the Ways and Means Committee has been completed. Senator Hopkins evidently takes the position that, inasmuch as the new tariff bill for the revision of the Dingley act is required by the Constitution to originate in the House of Representatives, it would not be profitable for the Senate committee to make a bill of its own, as such a course would render exceedingly difficult the harmonizing of the House and Senate bills.

Framing of Tariff Bill.

The procedure in the framing of all recently enacted tariff laws has been for the House to pass a bill and send it to the Senate, by which it has been referred to the Finance Committee. That committee has usually adopted the House classification and a large part of the rates, and has reported to the Senate the desired modifications in the form of amendments. It is understood that this procedure will be followed in connection with the forthcoming bill, although from present indications the Senate will make an unusually large number of amendments to the House measure. An important reason why the Finance Committee is disposed to defer the actual framing of a bill until the Ways and Means Committee has completed its work is the fact that the adoption of a maximum and minimum tariff scheme, which has practically been decided upon, will require the complete recasting of the present law, thus rendering it desirable that the new classifications as agreed upon by the House committee should be carefully examined before the Senate undertakes to fix new rates. Another consideration that will deter Senator Hopkins' subcommittee from holding early sessions will be the desire to avoid public hearings, for which a strong demand is anticipated as soon as the subject of rates is taken up.

The tentative announcement is made here that the Ways and Means Committee will meet in Washington on or about November 9, and after a few executive sessions will begin a series of hearings, at which domestic manufacturers and importers in all lines will be afforded opportunities to present oral and written statements in behalf of desired changes. The information embodied in the recommendations that have been presented to the Senate Finance Committee by the Treasury Department

and the Board of General Appraisers, a summary of which has heretofore appeared in *The Iron Age*, will also be transmitted to the Ways and Means Committee, and this will be supplemented by a large amount of data now being gathered by special agents of the Bureau of Manufactures and other confidential representatives of the House committee. As heretofore intimated in this correspondence, domestic manufacturers who propose to resist the general movement for tariff reduction will find it to their interest to inform themselves thoroughly regarding conditions in their industries abroad with a view to meeting arguments based upon the data gathered by the committee's agents.

Pressure For Higher Duties.

It is already apparent that much pressure will be brought to bear upon Congress to raise some rates of duty, and efforts are already being made by certain domestic producers to create sentiment in favor of higher duties, and especially for the transfer of products from the free to the dutiable list. One of the most active interests in this connection is that engaged in the mining of zinc ore, which is already bringing pressure to bear upon Senators and Congressmen. This work is understood to be in the hands of the so-called Zinc Ore Tariff Club, an organization of zinc miners in Missouri, Kansas, Oklahoma and Arkansas, who are demanding that the new tariff law shall contain a specific provision imposing a duty on Mexican zinc ores, which under recent decisions of the Board of General Appraisers and the lower courts are held to be free of duty. It is an interesting fact in this connection that the Federal Government has aided the domestic producers of zinc to the extent of carrying the pending case to the United States Supreme Court, and it is believed that the Treasury officials will co-operate further by recommending the adoption of a reasonable tariff rate on all forms of zinc ore.

The Ways and Means Committee is in receipt of a memorandum prepared by Col. Albert Clarke, secretary of the Home Market Club, Boston, giving some details of a canvass recently made by the club of 1000 typical manufacturers, who were asked to state what tariff changes their experience suggests. A few of these manufacturers, Colonel Clarke states, have recommended reductions "all along the line, giving no specific reasons and not confining themselves to their own business." Many, however, particularize, and "in most cases contend that the present duties should be increased or the classification or basis of computation changed," so that domestic products should receive the protection presumably granted by the Dingley act, but curtailed by reason of court decisions based on technicalities. "This information," says Colonel Clarke, "will doubtless be a great surprise to most of those who have called for reduction, and no honest protectionist can ignore or lightly consider it because it is the result of experience." In support of this statement figures are submitted showing the imports of the past seven years and recording heavy increases in many lines of manufacture.

It is a foregone conclusion that an exceedingly interesting feature of the coming hearings before the Ways and Means Committee will be the contest between various groups of domestic manufacturers who favor or oppose the general reduction of tariff rates. Rapidly accumulating indications point to a very conservative handling of the pruning knife by the Congressional experts.

W. L. C.

Nearly \$9,000,000 has been collected by the State of New York in taxes from corporations for the fiscal year which will end this month. State Comptroller Martin H. Glynn says this is an increase of more than \$1,000,000 over the collections reported in any one year in the history of the State, which is remarkable in view of the disturbed financial conditions during the year. It is credited to careful work in the Comptroller's office, which unearthed a large number of corporations that had paid no taxes for periods ranging from 2 to 13 years. The delinquent corporations were all made to settle within the strict letter of the law, and the payment of their back taxes went a long way toward swelling the increase.

The Latcher Non-Loosening Car Wheel.

As a means of securing car wheels more rigidly to their axles, J. W. Latcher, Edinburg, N. Y., proposes casting the wheel with a fluted bore and forcing it upon a rough turned axle of slightly larger diameter than the free bore of the wheel. The axle is preferably turned with a coarse V-thread, so that the diameter at the top of the thread is about one-sixteenth in. larger and the diameter at the bottom of the thread the same size as the hole

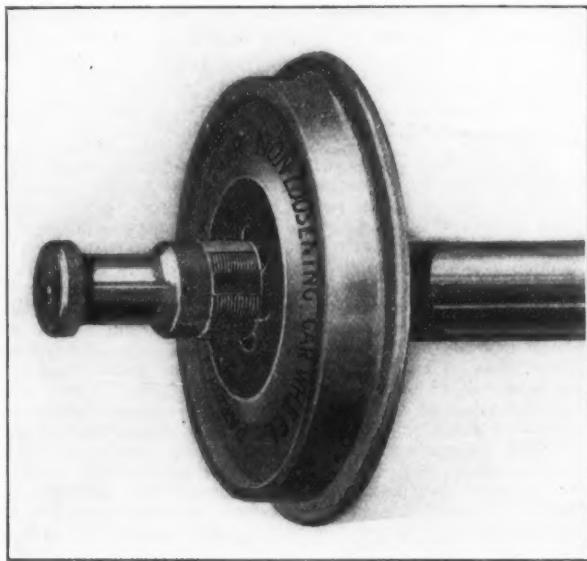


Fig. 1.—The Latcher Wheel, Showing the Fluted Bore and Flowed Axle.

in the wheel. When the wheel is forced on the axle the lands of the bore between the flutes plow furrows through the threads, shearing them from the axle in parallel grooves, so that the threads remaining in the flutes of the wheel bore become in effect keys, which im-

pose a high resistance to the twisting of the wheel on the axle. It is the inventor's contention that when ordinary car wheels become loose it is invariably due to the torsional strain occasioned by rounding curves or the uneven application of the brakes upon the wheels.

The patented construction of the Latcher wheel and

axle is shown in Fig. 1, which shows the plowed surfaces in the threaded part of the axle and the flutes in the bore which have cleared the threads on the corresponding parts of the axle and left them intact. It may be urged that this wheel has but half of the bearing surface on the axle, as compared with the present form of construction, which is true, and that it consequently has but half the resistance to torsion or twisting on the axle. A test proves the latter to be a fallacy, for the decreased surface appears to present as great a pressure on the axle as the ordinary smooth bored wheel, and, in fact, surface enough so that the wheel would be split by exerting too much pressure in the forcing on of the wheel. It might also be supposed that the decreased bearing surface on the axle would in time result in the reaming out of the hole in the wheel by thrusts or blows on the tread and flange from the rails. This would seem to be substantially refuted when it is considered that there is less than $\frac{1}{2}$ sq. in. of rail contact upon the wheel rim, as compared with some 20 sq. in. on the wheel seat, the latter being only about one-third of the bored area for the reception of the axle.

By means of the makeshift testing apparatus illustrated in Fig. 2 the inventor proved that the new manner of securing the wheels does offer greater resistance to twisting than the ordinary one. The disks on the axle in the illustration represent car wheels. The one at the right has a plain round wheel bore, 2 15-16 in. in diameter, and the axle is smooth and about 4-1000 in. larger in diameter than the hole in the wheel. The wheel on the left side is made with a fluted hole and is bored 2 14-16 in. in diameter, while the axle portion which enters the wheel is turned with a V-thread 15 to the inch and about 1-16 in. larger in diameter on the periphery of the thread than the hole in the wheel. Both wheels were forced on the axle with a pressure of 28 tons. To the wheels were secured levers, as shown, which were fixed at their outer ends, and beneath the axle was placed a jack screw, so that forcing the axle up had the effect of twisting the wheels on the axle, or tending to. In this test the wheel with a plain round hole turned on the axle when a force of not exceeding 1800 lb. had been applied by means of a jack screw. This corresponded to a

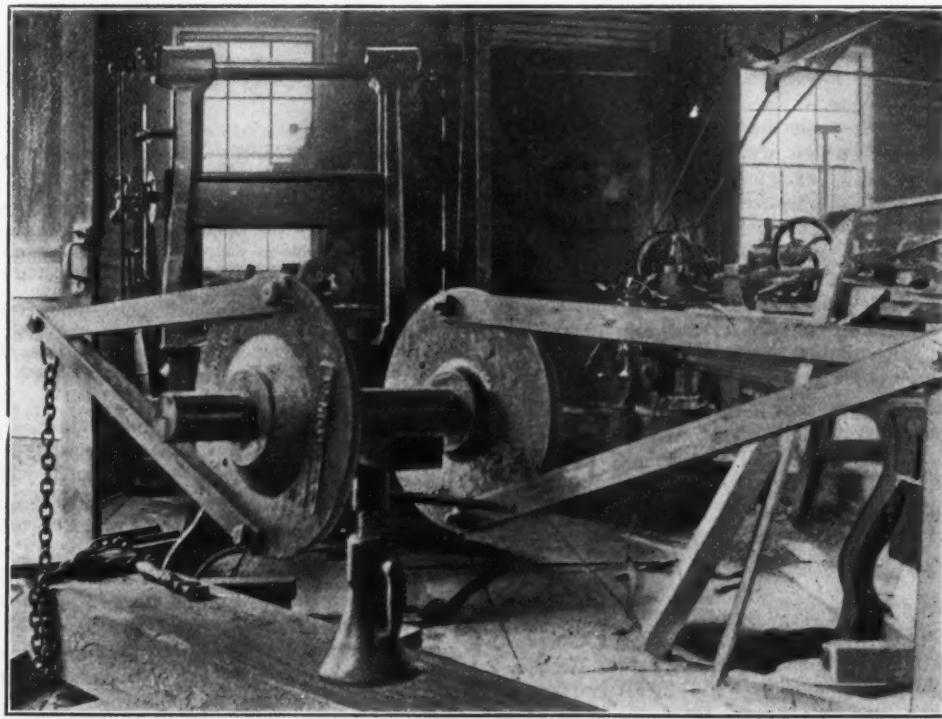


Fig. 2.—Apparatus for a Comparative Test of the Ordinary and the Latcher Methods of Securing Car Wheels on an Axle.

pose a high resistance to the twisting of the wheel on the axle. It is the inventor's contention that when ordinary car wheels become loose it is invariably due to the torsional strain occasioned by rounding curves or the uneven application of the brakes upon the wheels.

The patented construction of the Latcher wheel and

pressure of about 900 lb. on the end of each lever. The fluted wheel remained fixed to the axle.

Another test was made on a pair of car wheels and an axle made to scale one-sixth of standard size and with fluted holes and threaded axle. The wheels were fitted with clamp levers and power was applied to the

lever ends while the axle was held fixed. The axle was twisted through 180 degrees, but the wheels did not lose their grip on the axle.

The inventor claims that wheels can be made in this design with no more cost in the molding and casting operations than ordinary car wheels, and that the wheels will be much more safe and reliable. When the wheel is cast the flutes are cast in it, and the only machine work is the boring of the axle hole, as in the ordinary form of construction. The fluted hole may be cast with compressed sand cores made in fluted or corrugated form and set centrally to the tread or periphery chill of the flask, but cores without exterior protection used in this form would be likely to be broken or to move from their true positions. It is therefore proposed as a better practice to incase the core material in a corrugated or fluted band or chaplet of thin metal made to confine the core and prevent it from being dislodged or broken during the pouring. The use of this band or chaplet results in a clean opening, free from sand, so that in the boring of the wheel hub to the proper diameter for the axle the boring tool will not be so readily dulled as it would be if the ordinary method of coring were employed.

The Rearwin Emery Wheel Dresser.

A new emery wheel dresser invented by W. D. Rearwin, Grand Rapids, Mich., and marketed by the H. A. Stocker Machinery Company, Chicago, sole agents, is shown in the accompanying illustrations. The feature

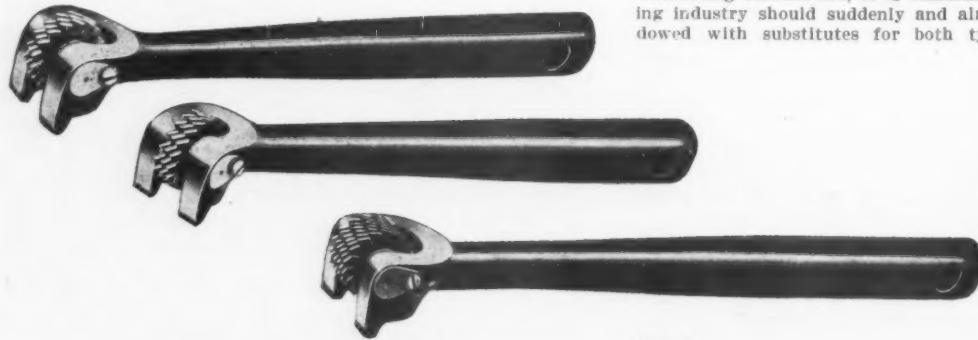


Fig. 1.

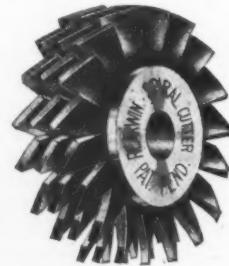


Fig. 2.

The Rearwin Emery Wheel Dresser Sold by the H. A. Stocker Machinery Company, Chicago, Ill.

of particular interest is the design of the cutter wheels, the cutting points of which are arranged in spiral form in such a manner that they lap each other and track the cut. The object of this construction is to procure a shearing cut on the face of the wheel that will leave a clean, sharp, straight surface. The teeth, which are broader at the cutting point than at the hub, are described as self-sharpening, and it is stated that they do not lose the sharp cutting edge at the first dressing of the wheel, but keep their shape and edge until the cutter is worn out.

The cutter, which is shown in Fig. 2, is made from spring steel tempered and oil drawn, and is furnished in two sizes, No. 1 and No. 2; the former may be used in the ordinary Huntington handle, while the latter can be used only in the Rearwin hollow handle, shown in Fig. 1. The cutters are $1\frac{1}{8}$ in. in diameter, No. 2 being double the thickness of No. 1, and used for dressing wide faced wheels.

The Rearwin hollow handles are made in the three styles, shown in Fig. 1. The upper one, style No. 1, uses No. 1 cutters, and is 12 in. long; style No. 2 uses the No. 1 cutter also, and is the same as No. 1 in all respects except that it has an offset head. Style No. 3 is 14 in. long and takes the No. 2 cutter, which is of double thickness. These handles being hollow are light and strong and are of neat design.

The total United States immigration for the month of August, 1908, was 27,782, as compared with 93,825 for the same month of last year, showing a decrease of 71,043.

A Double Revolution in Electric Lighting.

That the electric lighting companies of the country are responding quickly to the revolutionary situation resulting from the coming in of the tungsten lamp is brought out by the *Electrical World's* inquiries. The change was expected to come slowly, owing to the limited output of the lamps, but it is now estimated that 50,000 a day are being turned out, in addition to which are the importations, and as the new lamp has a life twice that of the carbon lamp, it is believed the urgent demand for the tungsten lamp will soon be met. The supplanting of the 16 candle power lamp by the 40 candle power lamp is an important feature of the recent evolution of electric lighting following the general use of the Welsbach mantle in gas lighting. The *Electrical World* says:

The return by gas users to the open jet basis of illumination would be just as probable as would, we believe, be the return from the 40 candle power to the 16 candle power candle basis by electric light users who have had some months' experience with the former. Still another consideration should be kept in mind in planning means for the introduction of the tungsten lamp, which is that the present cost of the lamp should not be given too great weight in formulating a policy. As in Europe, the price of the tungsten lamp was halved within a year and almost monthly notices of further reductions in price are being made, there is no reason to think that the present order of prices will be maintained in this country.

After some 20 years of an incandescent filament lamp that underwent little improvement in efficiency during that period, and with arc lamps that retrograded from the 1 watt per candle of the open arc to the almost 3 watts per candle of the inclosed alternating current arc, it is remarkable that the electric lighting industry should suddenly and almost simultaneously be endowed with substitutes for both types with an increase of

Fig. 1.

Inefficiency in each case far beyond the fondest expectations of the most sanguine believer in the possible improvement of electric light sources. The tungsten lamp must divide some of the honors of present-day lighting advance with the flaming arc lamp, for with its economy of 0.5 watt per candle the new arc promises to play the same part to the plain carbon arcs that the new incandescent does to the carbon incandescent filament. The new arc is, however, at present handicapped through attention being engrossed on the new filament lamp, and by the relatively high cost of the imported composite electrodes used in the arc lamp, though notwithstanding the latter consideration the lamp is more economical for certain uses than the old arc with its cheap electrodes.

The Carrier Air Conditioning Company.—The Carrier Air Conditioning Company, recently organized, has purchased the Buffalo Forge Company's rights to sell the air washers, humidifiers and humidity controlling apparatus manufactured under the Carrier patents. The general offices of the new company are at 39 Cortlandt street, New York. J. I. Lyle, for nine years manager of the New York branch of the Buffalo Forge Company, is now general manager of the Carrier Company. W. H. Carrier, the inventor of the systems of humidifying and humidity control bearing his name, is consulting engineer for the Carrier Air Conditioning Company.

The Ward-Dickey Steel Company's plant at Indiana Harbor, Ind., which has been idle most of the past month, will start up again this week, running full force, under improved conditions. During the shutdown orders have been accumulating, and the company now has a fair booking of specifications for its patent planished steel sheets, made from special analysis basic open hearth steel and finished under powerful planishing hammers.

The Virginia Iron, Coal & Coke Company.

The sixth annual report of the Virginia Iron, Coal & Coke Company, covering operations for the fiscal year ending June 30, 1908, presents the following income account:

	Gross earnings.	Operat. expenses.	Profit.
Furnaces	\$2,275,715.80	\$1,979,435.79	\$296,280.01
Foundries	76,535.02	73,893.06	2,641.96
Coal mines	837,296.64	670,549.98	166,746.66
Coke ovens	420,030.40	414,667.93	5,362.47
Sawmills	869.10	869.10	.....
Crescent Works	117,481.37	117,294.60	186.77
Grist mills	200,693.15	192,343.63	8,349.52
Totals	\$3,928,621.48	\$3,449,054.00	\$479,567.39
Miscellaneous earnings			40,748.85
Interest and discount			47,630.46
Farms and farm rentals			8,760.94
Total income			\$576,707.64
Less taxes, insurance, bond interest, development, &c.			458,762.62
Net profit for the year			\$117,945.02

Following is the general balance sheet for the year ended June 30, 1908:

Debits.	\$13,306,049.63
Real estate and plant	\$13,306,049.63
Equipment	270,024.31
Securities owned	196,863.20
Sales ledger balances	120,600.41
Sundry bills, ledger balances	24,844.85
Open accounts	39,478.75
Bills receivable	834,293.41
Advances to cashiers and superintendents	5,375.00
Cash balances at commissaries	1,716.08
Cash on hand	51,645.14
Sinking fund	268.89
Stock of general material:	
Pig iron	815,648.00
Other products	93,459.94
Raw material	372,677.43
Supplies	254,045.10
Merchandise	141,688.49
Farm products	23,802.45
Total	\$16,552,480.08
Credits.	
Capital stock	\$10,000,000.00
In the hands of the public	\$9,073,680
In the treasury of the company	926,320
First mortgage bonds	4,887,000.00
Prior liens outstanding: Carter C. & I. Company bonds	490,000.00
Unpaid vouchers	129,161.89
Unpaid pay rolls	51,775.15
Accounts payable	25,099.90
Bills payable	493,747.00
Taxes accrued	15,043.52
Fund for depreciation of coal lands	48,217.94
Fund for depreciation of ore lands	17,491.54
Fund for depreciation improvements to owned properties	145,345.71
Fund for depreciation improvements to leased properties	47,079.31
Fund for furnace repairs	12,052.11
Bond interest accrued—Carter bonds	6,125.01
Bond interest accrued—V. I. C. & C. Company bonds	81,450.00
Profit and loss	102,891.00
Total	\$16,552,480.08

From President Henry K. McHarg's accompanying statement we take the following:

On December 15, 1907, we shut down practically all our ore mines and continued in operation only two furnaces, one at Bristol and the other at Roanoke, running these two furnaces through the first six months of this year. As labor was very plenty, we resumed operations in our ore mines at a reduced wage scale on February 1, 1908, and have continued mining ore from that date. As the two furnaces have not used up the ore as fast as we mined it, we have accumulated over 100,000 tons of iron ore at our various furnaces as of July 1, 1908.

The hard times of last fall and winter affected our coal business just as disastrously as our iron, and we were obliged to shut down entirely two of our coal operations and reduce our production at the others very much, and also reduce the amount of coke produced. Your company made during the year ended June 30, 1908, a total of 134,271 tons of iron. The coal mined during the year was 968,141 tons, and the coke produced was 261,759 tons.

In line with the policy pursued by your board the last year or two, we have acquired by purchase about 1000 acres of iron ore lands near Cartersville, Ga., at a cost of about \$108,000, paying for the same in cash.

We have continued to spend liberal amounts in improving the furnaces, coal mines and ore properties during the past year.

Since the close of the fiscal year the Southern Railway Company has paid the balance due us, with interest, for the purchase of the Virginia & Southwestern stock, so that all our demand bills payable, as shown by the balance sheet, have been paid, and your company has a cash balance at this writing in bank of about \$250,000.

Very low prices have been made for Virginia and Alabama irons within the last four months, and your management has not continued making sales, believing that sooner or later a demand must take place for iron which would enable us to secure better prices. With this end in view at the writing of this report your company has on hand at its various furnaces approximately 70,000 tons of iron. This is all paid for and no money has been borrowed on it.

It seems to me there is one thing which is most gratifying, from the position of a holder of its securities, in regard to the affairs of the company. It is five and a half years since the company was reorganized, and on January 1, 1903, the quick assets, eliminating real estate, plant, securities owned and equipment, amounted to \$1,850,000. The outstanding accounts, including bonds, bond interest, accrued profits, unpaid payrolls, vouchers and accounts payable for depreciation of the ore and coal lands and improvements of furnaces, repairs, &c., amounted to \$9,594,000, which after deducting quick assets, \$1,850,000, leaves \$7,744,000 ahead of the capital stock of the company.

Adopting the same course and comparing it with the general balance sheet of June 30, 1908, the quick assets of the company amounted to \$2,775,000, and the indebtedness made up in the same manner as in the balance sheet of January 1, 1903, amounted to \$6,522,000; deducting the \$2,775,000, it leaves \$3,777,000 ahead of the capital stock of the company.

Subtracting this amount from \$7,744,000, as it stood on January 1, 1903, it leaves a decrease of \$3,967,000 in the liabilities ahead of the stock for the five and a half years of the company's existence, or approximately \$721,000 a year, or a sum in excess of 8 per cent. on the stock yearly since the organization of the company. This, of course, takes into account no part of the money which has been spent for the acquisition of new properties or the improvements of old ones, which amounts to an approximate sum of \$1,500,000. Of course, we have sold some properties, but at the same time we have purchased other new ones. Our coal lands have, without question, enhanced very much in value during the time mentioned, and my personal opinion is, that, taken as a whole, and estimating our property from a most conservative standpoint, what we have now is worth from 25 to 33 1-3 per cent. more than when the company was reorganized, on January 1, 1903.

Reference is made by the *Engineering Record* to three oil tanks which have been used since 1900 by a Portland cement manufacturing company to store cylinder, crank case and block oil, respectively. The three chambers are placed side by side, forming a tank 13 ft. 4 in. wide and 16 ft. 9 in. long, and approximately 12 ft. high. This is sunk in the ground and has a light frame house over it. Each tank holds 2000 gal. The concrete was made 1:2:4, using stone crushed to pass through a 1-in. ring. The inside of the tanks was plastered with a rich Portland cement mortar, well troweled in order to give a dense finish. No leakage has ever been detected, although it is often asserted that oil will destroy concrete.

What is said to have been one of the largest purchases of old arms negotiated by an individual concern has been effected by the Cal Hirsch & Sons Iron & Rail Company, St. Louis, Mo. It recently bought from the United States Government 250,000 Springfield rifles and carbines. It is said that the original approximate cost to the Government of these arms was about \$4,000,000.

THE IRON AGE

Established in 1855.

New York, Thursday, September 24, 1908.

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Railroad and Iron Trade Policies Concerning New Capacity.

The extent to which new construction work has been carried on by iron and steel companies since the panic of last October is in contrast with the embargo put on railroad expenditure. Some of the large interests in the iron trade have given practical proof of their confidence that after this famine year will come a period of increasing consumption, eventuating in a new record of production of all forms of iron and steel. Steel companies can be named, it is true, which have no extensions on hand at present, and in a few cases new construction work has been curtailed. But there are evidences that the experience of 1904 has been of value. Instances can be recalled in which steel companies which in that year allowed the policy of the railroads to govern them found out in 1905 that they had been shortsighted. In one case a strong steel company, with the money in bank for what was considered much needed new capacity when it was undertaken, stopped all work short when the slump came in the latter part of 1903. The new capacity could have been earning good profits had it been ready early in 1905, instead of the work dragging on through all that year and well into 1906. Machinery ordered after it became plain late in 1904 that a change for the better had come had to take its turn in the procession of orders that poured in about the same time, for then everybody saw that greater things were ahead.

As has been the case in every year since the United States Steel Corporation was formed, but more markedly now than in 1904, the new work of that interest has been one of the props of the iron trade since the panic of 1907. Indeed, the expenditures of the corporation this year have been princely in comparison with those of the railroads. Last year the outlays by subsidiary companies for additional property and construction were \$66,981,000, including \$19,343,000 for the Gary plant in Indiana. The annual report for 1907, prepared in the latter part of March, 1908, when the depression tinged every calculation of the iron trade, gave no intimation of a halt in the improvement programme. With scarcely an exception the various improvements and new enterprises of the Steel Corporation have been pushed ahead this year. At the beginning of the year the unexpended balances of appropriations for Gary were \$35,517,000, and it was estimated that \$18,000,000 of this amount could be spent there in 1908—that is, that the work which it was possible to put through in 12 months would require that amount of money. Similarly the amount unexpended on January 1, 1908, on extensions for other subsidiaries of the corpora-

tion was \$40,000,000, and it was estimated that plans calling for 85 per cent. of this could be put through this year. Thus the new capacity which it was estimated in March it would be possible to provide in 1908 represents a total outlay of \$52,000,000. It may be said that up to this time the rate of expenditure has been substantially as anticipated, including, of course, money for new mineral properties and new mining operations in coal and iron, as well as for vessels and railroads. Wherever work planned for 1908 has not been carried out, it is estimated that construction not contemplated at the opening of the year has fully made up for it.

Though publicity is not given to the new construction of the entire iron industry, as in the case of the Steel Corporation, it is known that important blast furnace and steel works construction work has been carried on by a variety of interests this year. Some of the independent steel companies rounded out extensive programmes of new work in 1906 and 1907, and naturally have found no occasion to enter upon new undertakings since. An important Mahoning Valley company has pushed blast furnace construction throughout the lean months of 1908. In the Pittsburgh District one of the largest independent steel companies curtailed operations at a new group of blast furnaces, but the work is even now making good headway, and important steel works extensions at the present site are being carried forward. Another company has completed an open hearth plant in the Pittsburgh District. Moreover, merchant blast furnace construction has gone on in the Chicago, Buffalo and Cleveland districts and in southern Ohio.

If it be said that the railroads had no need of additional equipment in the past year, when so much of what they had was out of use, it may also be said that the iron trade has not been calling for new blast furnaces and steel works. The steel companies are building for the future, not for to-day, and have faith that their look ahead will be justified by the outcome.

It must be admitted, however, that railroad finances are on a different basis from those of the Steel Corporation. The latter spent last year \$66,981,000 on new construction, besides \$20,324,000 for extraordinary replacements by its subsidiary companies, and paid for practically all of it out of earnings previously set aside, only \$2,348,000 being financed by the issue of securities or purchase obligations. The railroad habit, on the other hand, is to build and equip largely on the earnings of the future. Vice-President W. R. Taylor of the Reading Railroad Company contends that the extraordinary earnings of the railroads in the five years ending with 1907 have been due largely to the traffic created by their own enormous expenditures, for which to a considerable extent they have mortgaged the future. Such a view implies that it may be some time before the steel trade will hear from the railroads in the way in which it began to regard as normal last year and the year before. Admittedly an industry cannot lift itself by its own bootstraps, but it is a mistake to assume that the railroads can long have any option in the matter of patronizing the iron industry, and if such patronage adds materially to the prosperity of the railroad companies, so much the better prospect is afforded the buyers of their securities.

The Steel Corporation Not a Trust.

Is the United States Steel Corporation a trust, when the entire home consumption of steel products in the year 1908 might have been supplied by independent companies? And yet that is a fact. In 1907, a year of practically full employment, there were produced in all 19,-

52.5 per cent. was made by independent companies. The excess of exports over imports reduces the apparent consumption by 639,623 tons to roughly 19,200,000 tons. Last year the independent companies produced 10,423,786 tons, and as their share in the exports is comparatively light, they would be in a position to satisfy practically all requirements of 1908, estimated at roughly 50 per cent. of those of 1907 if the plants of the United States Steel Corporation did not turn a wheel. Control of 50 per cent. of the production certainly does not constitute a monopoly, and even though an organization is a unit in handling one-half of the total output, as against a scattered ownership of the other half, its powers of dictatorship must be too much tempered with diplomacy to justify the claim to or merit the odium of being a trust. It is neither good enough nor bad enough.



The Co-operation of Manufacturer and Dealer.

A vast difference is observed in the degree of attention that builders of machinery give to keeping agents and salesmen in touch with the more intimate development of their lines. It is a frequent topic of complaint by dealers that most of the manufacturers whom they represent confine their advices regarding new products and improvements to such details as are contained in the ordinary catalogue. Contrast is made between this procedure and the methods of those few manufacturers whose careful study of this branch of the selling end of their business has demonstrated that catalogue generalities should be supplemented with carefully prepared letters setting forth the more comprehensive details of specialized topics. Each adaptation of a machine is the subject of a communication to dealers and salesmen, telling the story as completely as possible and illustrating the facts by photographs, showing the machine in operation under the new conditions and the parts machined. An improvement on a tool is handled in the same manner. A new machine provides material for a series of communications as new points arise from time to time. In the case of the use of a machine for special work, the facts set forth include such items as the form and kind of material worked, how it is set up, the cutting tool employed, the speed and feed, and, perhaps, the amount of metal removed in cubic inches. A turret lathe may be applied to a new class of work, or it may be that a grinding machine, milling machine or drill is found adapted to something special. In any case the dealers are given new ammunition for their campaign for business.

Manufacturers of all classes of machine tools are constantly learning of new fields of usefulness for their products, and are of course frequently making improvements in design. Naturally, the salesman, especially if he is away from personal contact with the home plant, would like to be informed fully as to these things and how they happened to be developed, for sooner or later he may find a customer to whom the information may prove the suggestion for attaining decreased costs or improved product. The result would then be machinery orders for himself which would not have been booked had not the manufacturer kept him in close touch with new knowledge of the line.

The home sales department of an industry should be the clearing house of information bearing upon the product. Factory knowledge of improvements and changes and special uses should be combined with the news obtained from agents and salesmen, who should be encouraged to co-operate in the system. The sum total of the information should then be worked into confidential

bulletins in the form of letters, made as comprehensive as possible, containing all details, and whenever practicable illustrated by photographs and drawings. Such a bulletin would undoubtedly prove of value to show to a customer in demonstrating the fitness of a machine for his work. The system wherever tried has been found strongly stimulating to business. "Talking points" are constantly renewed. The salesman is placed at an important advantage over those of his competitors whose factories attempt no more than catalogue details in sending out advices of the developments of their lines. Occasionally it is of value to inform the agent, and through him his salesmen, of points in which a machine is at a disadvantage. The competitor is likely to find out these weaknesses and will use the knowledge in his business, and the salesman should be in a position to meet the criticism. There are few machine tools that are wholly without fault, especially where they lap over into the field of some other tool, departing to an extent from the particular functions for which their class was designed.

The machinery dealer is more apt to keep his manufacturers in touch with live conditions than is the factory to reciprocate in information of the right sort. Not only do orders booked by the agent and inquiries received from him contain information of vital interest to the alert machine builder, but in the selling field there is a wide opportunity to pick up valuable tips as to probable wants of customers; of opportunities to apply existing machines to new purposes in meeting special cases or even a new condition in some complete branch of manufacturing, which would extend the market in an important way. The salesman is often the first to find out what competing houses are doing in the way of improvements. All this part of the agent's routine is important work, and has its influence on earnings, if he does not neglect to inform the interested manufacturers. It would be difficult to dispute the statement that a practice of mutual exchange of news between dealers and machine builders should be a genuine money maker, bringing results so direct as to be easily recognizable as having their inception in the system.

Probably the system would be considered by some manufacturers as too elaborate in its details, entailing trouble and expense. A better way to look at it is whether the outlay of time and money would prove a profitable investment. The dealers who have had the opportunity to try it on individual lines are so impressed with its value that they are urging the other houses that they represent to adopt it. The manufacturers who are using it have the same high regard for the system. They feel that it has paid them well in sales that they trace directly to it, and which might not otherwise have been made, as well as in its less direct influence on other business. The dealer never gets stale for lack of new vitality of thought in working his trade. Most important of all, he is given good practical ideas which he can hand along to customers who would profit by them, and thus pave the way to orders. As an instance of this, a dealer is now interesting several manufacturers of his territory in the adaptation of a semiautomatic principle to a standard machine tool. He has the entire data, with photographs, of an installation which is successfully doing work similar to that required by these customers, and hopes to be able to interest them to the point of purchases of high priced machinery. The opportunity for such salesmanship methods should appeal to those manufacturers who have not yet taken up the question of information to agents, for it should suggest the possibilities of a better system than they are now employing.

A Blast Furnace "Revolution."

The "revolutionary" processes in iron and steel manufacture move in almost continuous procession through the pages of the daily press. It is common to read that electricity is about to do away with the cumbersome blast furnace as a means of extracting iron from its ores, and now and again a direct process for the manufacture of steel from ore is brought forward. A lately exploited process, of which something has appeared in press dispatches at intervals, is that of John T. Jones of Iron Mountain, Mich. It is now announced that "a new furnace that resembles the old style blast furnace [some are even now being built after that same pattern] about as much as a sewer pipe resembles a coffee grinder" is to be blown in shortly at Iron Mountain, representing the fruit of Mr. Jones' experiments in the past five years. These interesting details are given in addition:

The new Jones Furnace at Iron Mountain is mainly an immense tube 9 ft. in diameter and 120 ft. long, elevated at one end and rotated by spur gearing. It has corrugations and is lined with firebrick, giving a gradual feed from the upper end to the lower. The raw ore, crushed, is fed in at the upper end, where there is a temperature of 400 degrees F., and in a few hours reaches the lower end, where the heat is 1400 degrees F., just short of the melting temperature of iron. The fuel is hydrocarbon in gaseous form—presumably producer gas. The phosphorus contents are volatilized to the extent of 90 to 95 per cent of the original contents. The product is a spongy pig iron of superior Bessemer grade, made from low-grade silicious hematite, assaying about 37 per cent. iron ore [sic], as compared with iron contents of 54 to 68 per cent. in the standard Lake Superior Bessemer hematite ores. Mr. Jones has millions of tons of this low-grade silicious iron ore, heretofore used mainly as a "sweetener" for fine-grained Mesaba ores unduly high in phosphorus!

The cost of the new Jones furnace was \$54,000, and its rated capacity is 500 tons of pig iron daily. A furnace of equal capacity would cost about \$1,000,000 if built along the regular lines. Furthermore, the Jones furnace can be loaded on three flat cars by cutting the rivets, removed to any desired location and set up for work in a few days.

The Jones process of iron smelting, if successful, as it promises to be, will work the greatest revolution in the iron and steel trade of the world that has been made since the steel making process invented some 50 years ago by Sir Henry Bessemer. The standing of Mr. Jones is such that the blowing in of the new furnace is awaited with the keenest interest by all concerned in the iron and steel trade.

Without alluding further to the various lapses from technical exactness in the above, it is fair to say that the description is not that of the inventor, who has had many years' experience in iron mining on the Menominee range. The experiments at Iron Mountain recall the fact that some years ago another "Jones direct process," the inventor of which was not the Lake Superior iron miner, was tried at a New Jersey blast furnace—the old Hackettstown stack—but the results have caused no disturbance of the familiar lines of blast furnace practice in the United States.

In view of the declaration of dividend No. 1 on the Great Northern ore certificates on September 16, 1907, and of dividend No. 2 on March 16, 1908, each for \$1, there has been some comment on the passing of September 16, this year, without a similar dividend or any call for a trustees' meeting to consider the matter. It is assumed that no distribution will be made this fall, and the smallness of ore shipments this year is given as the probable reason. All the Hill ore leases have minimum tonnage stipulations, however, and royalties on these are payable regardless of the amount of ore mined.

Industrial conditions in the Youngstown District are better this week than last. The entire plant of the Youngstown Sheet & Tube Company, including the Bessemer steel department, is on in full. On Sunday night, September 20, the Bessemer plant of the Republic Iron & Steel Company started, and now nearly all the Republic finishing mills in the district are running. The Youngstown Iron & Steel Roofing Company is also in full operation. The Ohio Works of the Carnegie Steel Company is operating to about 70 per cent. of its capacity.

CORRESPONDENCE.

The Distribution of Burden Cost.

To the Editor: In your issue of August 20, I was much interested in an editorial in regard to the "Productive Hour System of Burden Costs." Rather as one searching for light than in any critical attitude, I feel prompted to state some examples in contra to those given in your editorial, to raise the query as to what your opinion would be as to the proper application of the burden cost.

I think it will be generally accepted that no hard and fast rule can be laid down. In our business alone we manufacture a wide variety of lines, from tacks to bar iron, embracing among other products bolts and nuts. To apply the burden on a productive hour basis to certain operations, we may take, for instance, the manufacture of a nut. A man can burr as a general rule considerably more than another man can forge. Both of these operations would take the same burden, whereas there is no comparison in supervision, power, repairs, space required, tools, insurance, expense and other items which enter into the burden. Similar cases contrasting different lines could be cited.

In re. example of bench work vs. machine work, in the application of power cost, it seems to me that distribution of power, in the same manner as other burden charges, is open to very many more qualifications and should, properly speaking, be handled as a separate burden, inasmuch as productive hours may be charged up in connection with which no power is used.

In the case of labor at 40 cents an hour, as compared with labor at 15 cents an hour, being placed upon the same basis, does it not appeal to you that the 40-cent labor is likely to be engaged upon very much more important work than the other, and consequently will require more attention in so far as supervision is concerned? It is probable that the higher priced man will manipulate more expensive machinery if he is engaged in such work, and the cost of his tools will be greater. If he is working at piece work rates, his product is likely to be very much greater than that of the man earning a lower rate, consequently greater repairs, more nonproductive labor required to handle the output, more power consumed, if power is included in the burden.

The productive hour basis reduces to a common level (if we may bring in an extreme example) a man working on gold to a man working on iron; one working on silk to one working on cotton. These are extremes in which, for instance, the value of spoiled work and many other items entering into the burden are reduced to a common factor, where it hardly seems right that they should be. However, the question is one which may perhaps be taken up by others better qualified to express an opinion on the subject, and I shall be interested in hearing further in this connection. With you, I attach a great deal of importance to the subject, believing it the crucial point in the application of any cost system, and the nearer that manufacturers can come to a consensus of opinion as regards the proper handling of burden, as applied to their respective business, the better it will be for all concerned.

MANAGER.

SEPTEMBER 18, 1908.

An unusual suit for strike damages was brought recently in Paris by three music hall singers against the Electrical Workers' Union. The plaintiffs asked damages on account of losing their turns when the theaters of Paris were closed by the strike of the electricians. The court decided that the secretary of the union, who was the chief defendant, was guilty of abuse of the right to strike and was responsible for damages resulting from such malicious interference with the life of the city and the rights of those who wished to work. Damages of \$1,600 and costs were imposed in each case.

As a part of its plan for its future cross-tie supply the Pennsylvania Railroad has set out this year 625,000 young trees, making a total of 2,425,000 trees set out in its campaign of reforestation.

The Shop High School System at Fitchburg.

Fitchburg, Mass., has adopted a co-operative shop and high school course, based on the plan that has been operative in Cincinnati for several years through the co-operation of the University of Cincinnati and various machine tool manufacturers in that city. The Cincinnati plan, however, begins with graduates from the High School, while the Fitchburg plan applies to the last three years of the High School course, so far as shop work is concerned. The initiative in the matter seems to have been taken by the Fitchburg Iron Workers' Association, an employers' organization in the local metal trades, which at a dinner to city officers and members of the Board of Education laid before them the plans for an industrial school, suggesting their incorporation in the Fitchburg school system. The idea was adopted by the School Board and is now in operation. On its face it has decided advantages over the manual training courses now provided by the high schools of the important cities of the country.

The plan provides for an apprenticeship system whereby boys having passed the first year in High School follow for the next three years a mechanical course, studying one week in the school and the following week working in the shops. A special instructor has been employed, and special text books provided. The boys are taken in pairs by the manufacturing companies, and the one who has studied in school a week goes on Saturday morning at 11 o'clock to the shop and learns on what particular job the other boy has been working, and how it is handled, so that he can come in the following Monday morning and begin work where his mate left off, thus following the shop course without necessitating instruction on the part of the shop foreman. The instructor in charge of this work at Fitchburg has had more applications than could be taken care of the first year, and all the boys worked in the shops for several weeks before the present school term opened. The school course is as follows:

FITCHBURG HIGH SCHOOL.—CO-OPERATIVE INDUSTRIAL COURSE.		
First Year.—All School Work.		Periods per week.
English .....	.....	4
Shop mathematics.....	.....	5
Mechanics .....	.....	5
Freehand and mechanical drawing.....	.....	5
Current events.....	.....	2
<i>Second Year.—School and Shop Work.</i>		
English .....	.....	4
Shop mathematics.....	.....	5
Chemistry .....	.....	4
Electricity and heat.....	.....	4
Freehand and mechanical drawing.....	.....	8
<i>Third Year.—School and Shop Work.</i>		
English .....	.....	4
Shop mathematics.....	.....	4
Commercial geography, business methods and conditions.....	.....	4
Advanced chemistry or industrial history.....	.....	5
Freehand and mechanical drawing.....	.....	8
<i>Fourth Year.—School and Shop Work.</i>		
English .....	.....	4
Civics and American history.....	.....	5
Applied mathematics.....	.....	5
Mechanical and freehand drawing.....	.....	8
Discussion of Current mechanical appliances.....	.....	2

Shop work consists of instruction in the operation of lathes, planers, drilling machines, bench and floor work, and such other machine work, according to the ability of the apprentice, as pertains to the particular branch of manufacture carried on in the shop where he is employed.

Shop Regulations.

A copy of the shop rules and regulations of the system is given below:

RULES AND CONDITIONS

Under which special apprentices taking the four-year co-operative industrial course at the High School of Fitchburg are received for instruction at the works of

1. The applicant for apprenticeship under this agreement must have satisfactorily met requirements for entrance to this course at the High School.

2. The apprentice is to work for us continually, well and faithfully, under such rules and regulations as may prevail at the works of the above company, for the term of approximately 4950 hr., commencing with the acceptance of this agreement, in such capacity and on such work as is specified below: Lathe

work, planer work, drilling, bench and floor work, and such other machine work, according to the capacity of the apprentice, as pertains to our branch of manufacturing. This arrangement of work to be binding unless changed by agreement of all parties to this contract.

3. The apprentice shall report to his employer for work every alternate week when the High School is in session, and on all working days when the High School is not in session, except during vacation periods provided below, and he shall be paid only for actual time at such work.

4. The apprentice is to have a vacation, without pay, of two weeks each year, during school vacation.

5. The employer reserves the right to suspend regular work wholly or in part at any time it may be deemed necessary, and agrees to provide under ordinary conditions other work at the regular rate of pay for the apprentice during such period.

6. Should the conduct or work of the apprentice not be satisfactory to employer, he may be dismissed at any time without previous notice. The first two months of the apprentice's shop work are considered a trial time.

7. Lost time shall be made up before the expiration of each year, at the rate of wages paid during said year, and no year of service shall commence till after all lost time by the apprentice in the preceding year shall have been fully made up.

8. The apprentice must purchase from time to time such tools as may be required for doing rapid and accurate work.

9. The said term of approximately 4950 hr. (three-year shop term) shall be divided into three periods as stated below, and the compensation shall be as follows, payable on regular pay days to each apprentice: For the first period of approximately 1650 hr., 10 cents per hour; for the second period of approximately 1650 hr., 11 cents per hour; for the third period of approximately 1650 hr., 12½ cents per hour.

10. The above wage scale shall begin the first day of July preceding the apprentice's entrance upon the first year of shop work of the High School Industrial Course.

The satisfactory fulfillment of the conditions of this contract leads to a diploma, to be conferred upon the apprentice by the School Board of Fitchburg upon his graduation, which diploma shall bear the signature of an officer of the company with which he served his apprenticeship.

The Baltimore Retort & Fire Brick Company.

The business of the Baltimore Retort & Fire Brick Company was started at Hull & Nicholson streets, Baltimore, Md., in 1868, by August Lambla, who molded the first clay gas retort made in America. This business had a gradual but steady growth, and its products are well and favorably known, not only in the South, but also in other sections of the country, notably in the New England States, where Waldo Bros., Boston, Mass., have an agency. The plant has grown to be one of the three largest in the country, making clay retorts, fire brick, fire tile, terra cotta chimney tops and vitrified clay specialties, the equipment permitting the manufacture and economical handling of shapes varying from one-sixth of an ounce to more than a ton in one piece. Exceptional shipping facilities are enjoyed, such facilities as can be had only in a city with the natural advantages of a location like Baltimore's. Located on the river front, with a railroad running into the plant, the company is enabled to obtain materials and ship its product most economically. These receiving facilities are most important, as there are no clays in any one section that are suitable for all purposes, and the best results are obtained by mixing those from different localities in such proportions as only many years' experience can teach to be the most suitable for each.

The fire that destroyed the main building, containing the machinery, manufacturing departments and general offices of this company, on August 17, again demonstrated the energy and enterprise of the business men of Baltimore—proved that the spirit that created a bigger and better Baltimore from the ruins of the disastrous fire of February, 1904, has lost none of its force. Within 24 hr. offices were installed in a building opposite the ruins of the plant, and customers had received notice that orders for regular shapes would be filled from the stock which was uninjured; also that kilns were in good condition, and arrangements would be made immediately to make and burn special shapes. Customers responded splendidly, incidentally reducing the stock materially. That there was an unusually large stock on hand at that time was due to the company's policy of not laying employees off because sales were below normal, thereby retaining their loyalty by assuring them of a regular income, and in this case showing a tangible profit by en-

abling the company to satisfy its customers so well that not one of them has placed an order elsewhere.

In two weeks plans had been made and ground broken for the erection of a building comprising the most approved methods and equipment. This new building will be built in front of the kilns, being separated from them by a fire wall. The retort department will be a brick building with clear space from ground to roof to give plenty of head room and free circulation of air to facilitate drying. A railroad track will be laid the length of this building, with a cross track at each end for switching purposes. Several other improvements in this department will increase the efficiency materially.

Parallel to this will be a two-story brick building, on the ground floor of which will be the grinding and mixing machinery, brick presses and dryers, so arranged that materials or goods in process of manufacture will always pass in the same direction—namely, toward the kilns. A system of elevators and conveyors will carry the prepared materials to the molding rooms on the second floor, which will be arranged so that each operation will carry the goods toward the kilns. The variety of shapes molded in these rooms is unlimited, including plain and flanged rectangular tile, irregular shaped tile, arches and jambs for fire doors, tube tile and baffle plates for water tube boilers, patent baker blocks and muffle and other parts for furnaces of every description using electricity, gas, oil or coal fuel.

A section of this department will be devoted to the molding of the company's patent tongue and groove arch lintels, for which there is a steadily increasing demand. They are tapered blocks of a size to form an arch 4½ in. thick and of a width proved by long experience most economical to set when ability to withstand expansion and contraction are considered. Various lengths from 8 to 20 in. are carried in stock. A tongue extends the full length along one side and a corresponding groove along the opposite side. These both strengthen the arch and break joints. The striking peculiarities of this construction are that no clay is required, and the arch is entirely independent of the piers or jambs, which can be renewed or repaired without disturbing the arch.

A steel structure will be erected to cover the kilns, also supplying a large space for storage of stock goods. A two-story brick building, with fireproof vault from ground to roof, will be erected at the southwest angle of the main building. General offices will occupy the first floor, where there will be an entrance to the lower deck of the vault, in which will be closets, shelves, &c., convenient for books, papers and other data pertaining to the accounting and sales departments. The second floor will be for the exclusive use of the engineering and drafting departments. From this floor will be the entrance to the upper deck of the vault, in which will be fixtures for the systematic filing of blue prints, sketches, descriptions, &c., of all shapes made.

This company designs and erects coal gas benches, muffles, kilns and other appliances for confining or conducting extreme temperatures. The proposed methods of safeguarding the designs, many of which contain original features, will preclude the possibility of their loss in case of another fiery visitation. Of most of those lost in the late fire there were duplicates, and sufficient data to replace the others will soon be compiled. L. N. Rancke, vice-president and general manager, expects the buildings to be completed and business adjusted to the new conditions by the end of this year.

Work has been commenced this week on an addition to the generating station of the Ontario Power Company on the Canadian side of the river at Niagara Falls. The extension will be of concrete construction 100 ft. long, of the same width as the present power house, to which it will conform in all architectural details. The addition is being erected to house two 12,500-hp. units. These generators, orders for which have already been placed with the Westinghouse Electric Mfg. Company, are of the largest type ever constructed, and are to be delivered in eight months. The contract for the power station extension specifies that it must be under roof by December 1.

Savings from the Retort Coke Process.

A Computation for 1907—Coal Tar Products Imported.

A summary of the report of Edward W. Parker on the "Manufacture of Coke in 1907," as issued by the United States Geological Survey, appeared in *The Iron Age* of August 20, page 511. The complete report has now been published and we take from it the discussion of the present status of the by-product coke industry in the United States and the argument for its more rapid extension:

When the economies which may be effected by the use of the retort ovens have been so clearly demonstrated, not only by the plants which have been constructed in the United States, but more emphatically through the much more extensive development of by-product coke manufacture in Europe, the condition in the United States, as shown by the statistics for the last four years, is somewhat difficult to understand. The economy shown by the higher yield of coal in coke has already been referred to, and, as previously stated, the production of coke in the by-product ovens of the United States in 1907 amounted to 5,607,899 net tons, valued at \$21,665,157. The total value of by-products obtained in the manufacture of this coke was \$7,548,071, this value and the quantity being distributed as follows:

	Quantity.	Value.
Gas, M cubic feet.....	20,516,731	\$3,130,839
Tar, gallons.....	53,995,795	1,242,530
Ammonia, sulphate or reduced to equivalent in sulphate, pounds.....	125,372,360	3,174,702
Totals.....		\$7,548,071

The gas included in the foregoing statement is the "surplus" not consumed in the coking process, and which is either sold or used at manufacturing establishments operated in connection with the coke oven plant. In a few instances where the surplus gas is consumed by the producing companies the quantity is not measured, nor was any value placed upon it in the reports made to the survey. In such cases careful estimates have been made, based upon the average surplus gas obtained from similar coals used at ovens of the same type. The value, similarly estimated, has been placed at from 10 to 15 cents per thousand cubic feet.

The Waste of Beehive Ovens Calculated.

The coal consumed in retort ovens in 1907 amounted to 7,460,587 short tons. The quantity of coal used in beehive ovens was 54,485,522 short tons, from all of which the possible by-products are apparently wasted. Assuming that the coal consumed in beehive ovens was of the same average quality as that charged into the retort ovens and that the prices would be not less than 80 per cent. of those ruling in 1907, the value of recoverable products which were thus apparently wasted last year amounted to \$44,000,000, a sum equal to nearly 80 per cent. of the total value of all the coal used in beehive ovens during the year. At the prices which prevailed in 1907 the value of the by-products wasted in beehive coke ovens was a little over \$55,000,000.

The value of the by-products from the retort ovens in 1907 was a little more than one-third the value of the coke produced in them. It should be remembered, however, that beehive ovens are located in the coal mining regions and that the cost of the coal charged into them represents only a little more than that represented by the expense of mining the coal, whereas in locating by-product recovery plants provision must be made for utilizing or marketing the by-products. It is for this reason that in the much larger number of cases the recovery plants are established near the larger cities and at considerable distances from the mining regions, and the expense of transportation is added to the mining cost of the coal. Hence it is that the value of the 7,506,174 tons of coal charged into by-product ovens in 1907 was \$15,874,430, or over \$2 per ton, while the 54,485,522 tons of coal used in beehive ovens was \$56,956,008, or \$1.05 per ton. It must also be remembered that the original cost of installation for a by-product recovery plant is from

four to five times that of a beehive plant of equal capacity. These disadvantages are in turn partly offset by the higher percentage yield of coke in the retort ovens and a lower delivery charge on the coke produced. In the case of beehive coke, railroad transportation expense is borne by the coke, while in retort oven practice all, or nearly all, of the freight charge is borne by the coal.

The total value of the 5,607,899 tons of by-product coke produced in 1907 was \$21,665,157, an average of \$3.86 per ton. The value of the 35,171,665 tons of beehive coke made in 1907 was \$89,873,969, or \$2.56 per ton. If we consider that the difference in the value of the by-product coke and beehive coke was due only to the difference in freight charges, then the total value of the entire product of beehive coke made in 1907 would, if made in retort ovens close to the market, have been worth \$135,750,000. Add to this the value of the by-products that should have been recovered of \$44,000,000, at 80 per cent. of the market price in 1907, the total value of the coke and by-products would have amounted to nearly \$180,000,000 instead of the value of \$89,873,969 for the beehive coke alone. The value of the coal charged into these ovens would have been \$108,879,870 instead of \$56,956,008. Carrying the hypothesis further, the difference between the value of the coke and by-products if the coal had been coked in retort ovens and the value of the coke alone from the beehive ovens was, say, \$90,000,000. From this should be deducted the difference between what the

gas to Plainfield, New Brunswick and other cities and towns, the maximum distance being 83 miles. At the present time, when the conservation of the natural resources of the United States is being so earnestly discussed, this matter of waste in coke manufacture is one which might well be given serious consideration.

In the following table is shown the record of by-product coke making since 1893, when the first plant was established at Syracuse, N. Y.:

Record of By-Product Coke Making, 1893-1907.

—Ovens.—				Pro- Build- duction,				—Ovens.—				Pro- Build- duction,			
Year.	Built.	ing.	net tons.	Year.	Built.	ing.	net tons.	Year.	Built.	ing.	net tons.	Year.	Built.	ing.	net tons.
1893....	12	0	12,850	1901....	1,165	1,533	1,179,900	1894....	12	60	16,500	1902....	1,663	1,346	1,403,588
1895....	72	60	18,521	1903....	1,956	1,335	1,882,394	1896....	160	120	83,038	1904....	2,910	832	2,608,229
1897....	280	240	261,912	1905....	3,159	417	3,462,348	1898....	520	500	294,445	1906....	3,603	112	4,558,127
1899....	1,020	65	906,534	1907....	*3,892	†330	5,607,899	1900....	1,085	1,096	1,075,727				

* Includes 1295 Semet-Solvay, 2002 United Otto, 387 Rothberg and 208 Newton-Chambers ovens.

† Includes 50 United Otto and 280 Koppers ovens.

At the close of 1907 there were 1270 Semet-Solvay ovens in operation, with 25 idle; of the United Otto type there were 2002 completed and 50 building. In addition to these there were 387 Rothberg ovens in operation during the year, but no new ones of this type were under construction. There were also 152 Newton-Chambers

Coal Tar Products Imported Into the United States, 1896-1907.

Year.	Alizarine and colors or dyes,		Coal tar colors or dyes, not specially provided for		Coal tar, all preparations, not colors or dyes.		Coal tar as benzol, toluol, &c.		Coal tar products, not medicinal, not dyes, known		Total.	
	Value.	Duty.	No duty.	Value.	Duty.	Value.	Duty.	Value.	No duty.	Value.	Duty.	
1896*....	\$138,013	Free.	\$994,395	\$662,450	\$2,918,333	\$729,583	.....	.....	.....	\$4,713,200	\$729,583
1897*....	201,980	Free.	1,023,425	812,884	3,163,182	790,796	.....	.....	.....	5,201,471	790,796
1898*....	28,688	\$6,794	886,349	1,087,704	3,723,288	1,098,532	\$134,416	\$26,883	\$228,037	6,088,482	1,132,209	
1899*....	57,192	18,536	700,786	743,130	3,900,099	1,170,030	221,101	44,220	393,602	6,015,910	1,232,786	
1900*....	89,175	24,069	771,336	537,812	4,792,103	1,437,631	274,946	54,989	397,780	6,863,152	1,516,689	
1901....	76,786	22,227	713,392	589,533	4,034,171	1,210,251	342,116	68,423	383,559	6,139,559	1,300,901	
1902....	57,852	21,913	1,028,327	631,467	4,911,668	1,473,500	496,928	99,386	368,098	7,494,340	1,594,790	
1903....	19,012	7,827	660,464	789,553	5,252,611	1,575,783	544,176	108,835	425,069	7,690,885	1,692,445	
1904....	7,305	3,276	636,418	686,184	4,903,077	1,470,923	522,242	104,448	391,645	7,146,871	1,578,647	
1905....	2,214	923	625,491	789,052	5,673,242	1,701,973	768,556	153,711	486,439	8,344,994	1,856,607	
1906....	2,772	991	661,155	806,901	5,717,932	1,715,380	864,067	172,814	483,416	8,536,243	1,889,185	
1907....	1,240	489	782,368	667,758	5,830,651	1,749,196	911,096	182,219	633,288	8,846,401	1,931,904	

* Fiscal years.

value of the coal would have been at retort ovens and what it was at beehive ovens, i. e., \$52,000,000. The remainder, \$38,000,000, less the difference in operating expenses, wear and tear, interest on capital, &c., may be considered as approximately the actual net loss in value as the result of beehive coke production compared with by-product coke practice in 1907.

The Lack of Market for Tar Products.

One of the reasons that has been given for the apparent lack of progress in retort oven building in the last four years is the lack of profitable markets for the by-products of coal tar, and this has contributed to the backwardness of the United States in the development of the chemical industries depending upon coal tar as a raw material, and yet this country is importing coal tar products to the value of several million dollars annually. It is also well known that the development of the coal-briquetting industry has been retarded because of the lack of assurance of a satisfactory supply of suitable coal tar pitch for binding material, and there is also an increasing demand for creosoting oils for the preservation of timber. The accompanying table shows the value of the coal tar products imported into the United States and the duty paid thereon in each year since 1896, inclusive.

There does not appear to be any trouble in disposing of the ammonia, for which a good demand exists, and the practicability of long distance transmission of the gas has been successfully demonstrated, thus insuring markets for the surplus of this retort oven product. The United Otto oven plant at Camden, N. J., is distributing

ovens in operation at Vintondale, Pa., during 1907, but no by-products, except of an experimental character, were obtained. The plant of 56 Newton-Chambers ovens constructed at Pocahontas, Va., has not been in operation for several years.

A Canal Boat Dumping Machine.—The McMyler Mfg. Company, Cleveland, Ohio, has closed a contract with the Lehigh Coal & Navigation Company for a large coal handling plant, to be located in Philadelphia. Following in some ways the general plan of the car dumpers built by the McMyler Company, the plant will contain a novel device—a machine that will take a boat out of the water, elevate it about 60 ft., turn it upside down and discharge the cargo. The unloader will have a capacity of 85 tons, the capacity being sufficient to raise and unload a canal boat. The coal, after being discharged, may be delivered into other vessels or conveyed into storage. Means is also provided for taking coal out of storage and delivering it into vessels, buckets and electric cars being provided for that purpose. Provision is also made for screening the coal while it is being unloaded, and for handling it with minimum breakage. The plant will be ready for operation in less than a year.

For some months the shops of the Pennsylvania Railroad Company, at Altoona, Pa., have been working about 36 hr. per week, but recently the time was increased to 50 hr., affecting about 4500 men, working on locomotive repairs. The company recently increased its force of freight car repair men, with the object of getting its freight cars in shape for such increased business as may develop.

American Naval Ordnance.

BY SIDNEY G. KOON.

Much has been written lately on the subject of the erosion of heavy guns, and so important has the matter been considered that, in the interest of limiting this destructive propensity of modern high explosives, the United States Navy Department has within a year or so put into effect a new schedule of muzzle velocities calling for something like 100 ft. per second less than was the intention when the present guns were designed. This seems to have been a step in the right direction, for one of the most prolific causes of great erosion is generally conceded to be the high velocity with which the heated powder gases traverse the bore of the gun; but it does not wholly solve the problem of getting out of the guns as much in the way of destructive energy as possible.

The Era of High Velocities and Heavy Projectiles.

It is now some 18 years since the famous Canet Works put out three 12.6-in. guns for the Japanese Navy, one being mounted on each of three cruisers—Itsukushima, Hashidate and Matsushima—the last-named of which was recently blown up with great loss of life. These guns were tested to the then unheard-of velocity of 3300 ft. per second, and, with their 1000-lb. shells, were justly considered the most formidable afloat. These guns were long rated at 3000 foot-seconds, and even now are credited with 2306, and a muzzle energy of 35,225 foot-tons. This was the beginning of the era of high velocities, and much was heard after this of the supreme qualities of flat trajectories, which necessarily accompanied the great muzzle velocities provided. And the first real setback which this idea has received may be said to be the action above noted—of reducing the service velocities on American guns.

During a period when flat trajectories were the vogue the Krupp establishment, while not disdaining that method of obtaining high energies, yet paid more attention to getting the same muzzle results from the use of a much heavier shell than other builders were using, and accompanied by a more moderate velocity. The trajectory was not so flat, nor was the ultimate danger space so great, but the remaining energy at battle ranges was much improved by the heavy shells, and the striking power actually enhanced over that of the swifter but lighter projectiles of other makes. The latest heavy guns turned out for the German Navy are in line with this development, and, indeed, have carried it much further along than before, the 11-in. gun now using a 760-lb. shell in place of one of 595 lb., while the muzzle velocity is still at the relatively high figure of 2854 ft. per second. The new guns of the French Navy are based on the same ideas, for the weights of projectiles have been increased from 750 to 970 lb. for the 12-in. guns and from 317 to 485 lb. for the 9.45-in. weapon, both being discharged at 2675 ft. per second.

A New Departure Proposed.

With the double idea of raising the ultimate remaining energy at battle ranges and of decreasing erosion in the bore of the gun by reducing the muzzle velocity, while still retaining about the same muzzle energy, and with the further object of making all the naval shells of different calibers geometrically similar, the writer proposes a new departure along this line. This is by giving each projectile a weight in pounds equal to five-ninths of the cube of its diameter in inches, and at the same time reducing by an additional 100 ft. per second the muzzle velocities. We will then find that, with the sole exception of the 4-in. gun, which has relatively the heaviest shell in our service, our muzzle energies will be slightly increased, while at an assumed battle range of 5000 meters (just over 3 miles) the advantage in this respect is very marked, amounting to 5½ per cent. for the 12-in. gun, and similarly for the others. For the 7, 6, 5 and 3 in. guns this advantage actually exceeds 20 per cent.

The accompanying table, arranged for the purpose of presenting the data compactly, is in three parts. The first part deals with American naval ordnance as at

present used; the second part gives for comparison figures of the latest English, French and German guns, in which it is seen that the English still cling to the light shell and high velocity, and the third part embodies the proposed change as outlined above, and includes also provisional figures for guns of 9, 11 and 13 in. caliber. The "remaining velocities" have been calculated by means of Ingersoll's "Ballistic Tables" (Navy Department, 1893).

Present and Proposed Ordnance Practice.

Gun.	Muzzle.			At 5000 m.			Muzzle energy	
	Shell. Lb.	Veloc- ity. Ft.sec.	Energy. Ft.tons.	Shell. Lb.	Veloc- ity. Ft.sec.	Energy. Ft.tons.	(Diam.) ³	Lb. Charge.
12-in...870	2,700	44,025	1,923	22,340	0.503	335	131.5	
10-in...510	2,700	25,805	1,804	11,535	0.51	205	125.9	
8-in...260	2,750	13,647	1,657	4,960	0.508	100	136.5	
7-in...165	2,700	8,349	1,459	2,420	0.481	59	141.4	
6-in...105	2,800	5,714	1,377	1,382	0.486	38	150.2	
5-in...60	2,700	3,036	1,152	553	0.48	20	151.8	
4-in...33	2,800	1,796	1,075	265	0.516	12	149.7	
3-in...13	2,700	658	861	67	0.481	4	164.5	
12-in...850	2,960	51,664	2,100	25,832	0.492	Brit., 50 cal.		
12-in...970	2,675	48,115	2,018	27,414	0.561	Fr., 45 cal.		
9.45-in...485	2,675	24,058	1,798	10,870	0.575	Fr., 1906.		
11-in...760	2,854	42,979	2,025	21,396	0.571	Ger., 1907.		
13-in...1,220	2,600	57,242	1,928	31,554	0.555	420	136.2	
12-in...960	2,600	45,045	1,881	23,580	0.556	340	132.5	
11-in...740	2,600	34,720	1,827	17,187	0.556	255	136.1	
10-in...555	2,600	26,040	1,762	11,960	0.555	200	130.2	
9-in...405	2,650	19,789	1,721	8,346	0.556	145	136.4	
8-in...285	2,650	13,890	1,632	5,270	0.557	102	136.1	
7-in...190	2,600	8,915	1,490	2,930	0.554	65	137	
6-in...120	2,700	6,072	1,413	1,664	0.556	45	134.8	
5-in...70	2,600	3,284	1,213	715	0.56	24	136.8	
4-in...35	2,700	1,771	1,069	278	0.547	13	136.3	
3-in...15	2,600	704	909	86	0.556	5	140.8	

The first six columns of this table are self-explanatory. The seventh gives the results obtained by dividing the weight of the shell in pounds by the cube of its diameter in inches, and illustrates very forcibly the present lack of uniformity, from a geometrical standpoint. The third part of the table shows in this column a very different sort of thing; and it may be noted as a curious fact that in every case the product obtained by multiplying the diameter cubed by five-ninths, gave a figure which is a factor of five (of course, some fractions were encountered, but the results as shown in the table are all within five-ninths of 1 lb. of the actual geometrical result). The last column is the quotient of the muzzle energy divided by the powder charge, and represents the number of foot-tons per pound of propellant. In the case of the last list these charges were of course assumed, the assumption giving in each case a result in foot-tons per pound about equal to the average for the heavy guns in the first list.

It will be noted that it is not proposed to change the guns (except possibly by the addition of a 13-in. gun of 45 calibers), but that the same guns are to be used, with heavier shells, and, except for the 10-in., very slightly heavier charges. The chamber pressures should remain about as at present—somewhat under 17 tons per square inch. The reduction in erosion should be quite marked, resulting in a longer lease of life to the gun, but, of course, the weight of ammunition to be carried would be considerably increased if the same number of rounds is to be carried. This, however, would be offset by the greatly increased power of the weapons at the point where power is needed—the point of impact—and penetration should result in many cases where now the shell would fall back into the water or smash itself into fragments on the face of the armor plate.

Dr. Charles E. Lucke, professor of mechanical engineering in Columbia University, is of the opinion that the upholders of the gas engine are too forward in their claims. He says: "There is no doubt that the combination of gas producer and engine will drive vessels more economically than steam, and that labor conditions in the ships will be improved by the adoption of this kind of power. But we have not the producer or the engine as yet. You cannot go in the market to-day and buy a gas engine that will drive a large ship. There are plenty of designers that will promise to build one, but engineering experience has proved that it is a long trip from designer to successful installation."

Trade Publications.

Electric Mining Machinery.—Goodman Mfg. Company, Chicago, Ill. Two bulletins and binder, forming a sectional catalogue illustrating the company's line of electric mining machinery and power plant equipment. Bulletin No. 301 describes and illustrates the Goodman rack rail haulage system, which, it is claimed, is especially adapted for hilly mines. Numerous views are shown of electric locomotives operating on live rack rails both in mines and in the open. Several standard types of rack rail locomotives are shown and sectional diagrams and illustrations are given. Bulletin 501 is devoted to gathering locomotives, which are adapted for switch work, picking up loads, distributing empties, &c. These locomotives are especially adapted for operating in close quarters and on sharp curves, and a feature of their operation is the quickness of the control. These machines are operated by a trolley, and machines designed to meet special conditions are shown in operation.

Ore Handling Machinery.—Andreson-Evans Company, Chicago, Ill. Catalogue, 8 $\frac{1}{2}$ x 11 $\frac{1}{2}$ in., 16 pages. Principally given to describing self-filling and dumping buckets. The book contains numerous drawings illustrating the operation of the Andreson-Evans type B grab buckets, which it is claimed have an advantage over the ordinary type of clam shell and orange peel buckets because they have a greater length of opening and more powerful digging action, making them especially adapted for digging ore. The Andreson-Evans conveying bridge or crane is shown, equipped with a 14-ton ore digging grab bucket, and an unloading and storage plant designed by the company is also illustrated by a line drawing.

Feed Water Heaters.—Harrison Safety Boiler Works, Philadelphia, Pa. Booklet entitled "Steam, Its Profitable Utilization." This is an article reprinted from the *Bookkeeper and Business Men's Magazine* discussing the steam requirements of prime movers, such as pumps, reciprocating engines, steam turbines, &c., under different conditions, such as when exhausting freely to the atmosphere, running condensing, &c. The article demonstrates how much of the heat contained in the steam is utilized to produce power and what proportion is available for heating or other use.

Oilers, Flexible Shafting, Dies, Special Stampings, &c.—Gem Mfg. Company, Pittsburgh, Pa. Catalogue No. 5, 6 x 9 in., 42 pages. Treats of a line of devices made by the company such as those mentioned above, boiler tube cleaning devices, loose pulley lubricators, portable drills, grinders, tapping and reaming machines, torches and mill supplies made by the company. A good portion of the book is given to oilers, which are made by the company in about every known style. Illustrations of flexible shafting are also given and portable drills, grinders, tapping and reaming machines are shown in several standard styles. Some space is given to useful tables, such as speed of drills and directions for calculating the amount of horsepower a belt will transmit, &c.

Miscellaneous Machinery and Supplies.—Central Machinery & Supply Company, Inc., Chicago, Ill. General catalogue No. 43, 8 x 9 in., 257 pages. Deals with miscellaneous machinery and supplies, including steam, gas and gasoline engines, machine tools, pumps, belting and other goods. Particular attention is given to pneumatic water supply systems and steam, hot water and hot air house heating equipment and apparatus.

Mining Machinery.—Galena Iron Works Company, Galena, Ill. Catalogue No. 1. Paper covers, 126 pages. Opens with a description of the treatment of zinc ores in plants designed and equipped with special machinery built by the company. Besides the outline given of the process through which the ores pass in crushing, roasting and concentrating, a number of engravings are shown illustrating the various steps of progress through the plant. It is stated that in the treatment of zinc ore in the Wisconsin, Illinois and Joplin districts the only successful operation is that of magnetic separation after roasting. The catalogue also shows an assortment of power and mining machinery, which the company handles, including air drills, boilers, engines, compressors, electrical equipment and general supplies.

Crucible and Open Hearth Steels.—The Vulcan High Speed Steel Company, Pittsburgh, Pa. Catalogue No. 4; 3 $\frac{1}{4}$ x 6 in. Describes in particular the various grades of tool steel made by this company, including Vulcan and Hecla. Gives classification and price-list of flat and other shapes of tool steel as well as die blocks and disc classification, also catalogues open hearth machinery steel, file steel and gives tables for computing the weight of cast steel, flat bar steel and other miscellaneous information.

Drills and Cutters.—Baldwin Steel Company, 133 Reade street, New York City. Catalogue; 6 x 9 in. 80 pages. Describes the drills made by this company both straight and taper and special drills for oil tubes. It also describes and catalogues reamers and the Hudson patented reinforced stay bolt tap. In the line of cutters are such tools as plain milling cutters with inserted or nicked teeth, concave and convex cutters, as well as special forms for cutting gears, slots and angles.

The German Iron and Steel Syndicates.

It is reported that the committee representing the four district pig iron syndicates in Germany, which has been working on a scheme for a general pig iron syndicate, has ceased its conferences in view of the refusal of the Kraft Iron Works to join in the movement. It is now stated that the prolongation of the pig iron syndicates beyond the end of 1908 is not likely.

The Rolled Rod Syndicate has continued the price of \$31.50 a ton for the inland market for the last quarter of the year. In view of the decline in export prices the bounty of \$4 a ton will be continued on exports for the final quarter. The negotiations for the formation of a syndicate in the wire and wire nail trades appear to be at a standstill. The Association of Hoop Iron Mills will continue the price of \$31.50 a ton for the last quarter of the year.

The Steel Syndicate has increased the bounty on structural shapes from \$1.25 to \$5 a ton with a view to promoting the export trade. It has been intimated that the Steel Syndicate has been able for some time to dispose of only 60 to 65 per cent. of the total allotment. Merchants associated with the syndicated steel works have been selling shapes at prices below those charged by the syndicate.

A Large Iron Ore Concentrating Plant.

The Oliver Iron Mining Company, a subsidiary of the United States Steel Corporation, will build at once a very large iron ore concentrating plant on the western Mesaba to concentrate ores from the Canisteo, Walker and Holman mines. A part of the output of these and other mines of the western Mesaba is mixed with sand which must be washed out. The plans for the new plant have been worked out. It will have a capacity of 1,250,000 tons of washed ore per annum, and will cost in the neighborhood of \$1,500,000. It is in the western Mesaba district that the principal deposits are located which are embraced in the Hill lease.

The Mechanical Engineers.—The season of professional meetings of the American Society of Mechanical Engineers will be opened on the evening of October 13 by a meeting of the Gas Power Section in the Engineering Societies Building, 29 West Thirty-ninth street, New York. H. L. Doherty, chairman of the Meetings Committee of the section, will present a report for discussion outlining plans for future work, and there will also be a discussion of standards to be used in gas power work. Two papers will be read, one by E. A. Harvey on gas producer plants, with data upon costs, performance, &c., and one by N. T. Harrington giving the results of tests to determine the loss of fuel weight in a freshly charged producer, due to increase of ash contents in the fuel bed.

The Associated Foundry Foremen of Philadelphia and vicinity held their first meeting following the summer recess on the evening of September 15. The association has changed the date of its regular meetings from the second Monday to the third Tuesday of each month, and the meetings are now being held at 1034 Arch street, Philadelphia, in place of Thirteenth and Arch streets, as heretofore. The meeting was well attended, the subject for discussion being "The Annealing of Steel Castings," on which C. G. Baumgartner was the principal speaker.

The Maxim Silent Firearms Company has been incorporated with a capital stock of \$250,000 to manufacture silent attachments for large guns, the invention of Sir Hiram Maxim. Robert W. Lesley, a director of several large cement companies and president of the United Building Material Company, Pennsylvania Building, Philadelphia, Pa., is one of the incorporators.

NEWS OF THE WORKS.

Iron and Steel.

Henry H. Hossman, Portsmouth, Ohio, contracting engineer for steel construction, blast furnaces, &c., has received contract for building three new hot blast stoves and one stack for the Wellston Steel & Iron Company, Wellston, Ohio. This order makes nine stoves built by Mr. Hossman in that district in the last 18 months. In addition he built one complete furnace for the Jackson Iron & Steel Company at Jackson, Ohio.

The Richard Heckscher & Sons Company, Swedeland, Montgomery County, Pa., expects to blow in its No. 2 blast furnace about October 1. It has been greatly improved and enlarged and will add from 250 to 300 tons of iron per day to the output of the company. With both furnaces in operation the output at Swedeland after October 1 will be 600 to 700 tons a day.

Geo. Greer, former district manager of the American Sheet & Tin Plate Company, New Castle, Pa., advises us that there is no truth whatever in the report that he with some associates will build a new tin plate mill at New Castle. Mr. Greer states that the matter was never even considered.

The National Refined Iron & Horse Shoe Company, Pittsburgh, Pa., contemplates locating its plant in Rochester, Pa. The matter is in the hands of the Business Men's Association, and prospects for the location of the plant at Rochester are said to be good.

Power Plant Equipment.

The Board of Public Service of East Liverpool, Ohio, will receive bids until September 30 for two 80-hp. horizontal standard Scotch boilers with the necessary fittings, also two 80-hp. boilers of the horizontal tubular type, 40 in. diameter and 16 ft. long.

The Water Department of Houston, Texas, will receive bids until October 19 for a 15,000,000-gal. pumping engine for the water works.

The Board of Trustees of Alleghany, N. Y., will receive bids until September 29 for furnishing the materials and constructing a system of water works, the requirements including four miles of 10, 8, 6 and 4 in. cast iron pipe, two gas engines, triplex power pumps, pumping station, hydrants, valves, etc.

Elbert B. Hamlin has been appointed receiver for the Munoz Boiler Company, 2 Rector street, New York. The liabilities are said to be over \$70,000.

The Heine Safety Boiler Company, St. Louis, Mo., has awarded contract for the construction of its new plant, the dimensions of the buildings of which have been previously stated in these columns.

The New Mexico Power Company, El Paso, Texas, in which E. Krause is interested, intends to develop a 2000-hp. hydroelectric plant on the Penasco River, for the equipment of which five Pelton wheels with electric equipment, wire, steel towers, &c., will probably be required.

Bids opened on September 17 by the Village Board of Champaign, Ill., for electric light plant equipment, including a 75-hp. gas producer and engine, or 50-hp. steam engine, were all rejected.

The A. W. Wycoff Company, Farmers' Bank Building, Pittsburgh, is installing two 300-kw. generators in the Boggs and Buhl Building, Northside, and a 600-kw. generator in the Oliver power building, Pittsburgh.

Vollkommer & Hagan, consulting engineers, Empire Building, Pittsburgh, have contracts for the installation of batteries of Rust boilers at Detroit, Mich., for the M. A. Hanna Company, and for the foundations and boilers for another large plant at that place.

The establishment of a municipal electric plant at Danbury, Iowa, to cost about \$7000, has been voted on favorably by the city of Danbury, Iowa.

Foundries.

Plans have been completed for the organization of the Sayre Iron Works, Inc., Phœbus, Va., and the plant which was destroyed by fire July 8 has been replaced by a temporary structure to be operated during the building of the new shops. The dimensions of the new foundry were given in these columns a few weeks ago. The temporary shops are now in full operation and the company is in a position to take care of all work that can be handled without cranes.

Bridges and Buildings.

J. Henry Crane has been appointed receiver for the New Jersey Structural Company, Plainfield, N. J.

The Baltimore Bridge Company, Baltimore, Md., has purchased the ground adjoining its works on Bush street from the Iron Clad Company of Maine, the plot having a frontage of 276 ft. and a depth of 200 ft., on which there is a building 100 ft. long. The company bought this property to get the vacant strip of ground in the rear of the building which it will use for additional storage of material. Having no immediate use for the building, the company has leased it to the J. C. Elchmann Mfg. Company, manufacturer of plumbers' supplies. This property gives the company a continuous frontage on Bush street of about 1100 ft. from the Baltimore & Ohio Railroad to Sassa-

fras street and about 10½ acres of ground on which it has two other buildings, one leased to the Baltimore Foundry Company and the other to the Thomas C. Basshor Company. The Baltimore Bridge Company's own works are in the rear of the Bush street buildings and are served by spurs from the Baltimore & Ohio Railroad.

The Standard Pattern Company, Pittsburgh, has completed making several large patterns for castings, to be used in the erection of a large swinging bridge in Vancouver, B. C. The Fawcett Machine Company, Pittsburgh, has the contract for finishing the castings, one of which is the trunion casting, measuring 5 x 4 x 9 ft. high.

Fires.

The horse shoe department of the Old Dominion Iron & Nail Works Company, Richmond, Va., was burned September 17, the loss being about \$10,000.

The plant of the Monarch Brass Mfg. Company, Port Colborne, Ont., was burned September 18, the loss being placed at \$50,000.

The plant of the Victor Mfg. Company, Leavenworth, Kan., was damaged \$12,000 by fire September 12.

The wire plant of the Jacob Haish Company, De Kalb, Ill., was burned September 13. The loss is estimated at \$100,000.

A second large fire occurred in Chelsea, Mass., September 21, when it is estimated that \$400,000 damage was done. The buildings burned included the box factory of Atwood & McManus, the plant of the Union Metal Company and Lee Brothers' shoe manufactory.

Miscellaneous.

The receivership under which the National Battery Company, Buffalo, N. Y., has been operating since last February terminated August 19. All claims against the company have been settled and the entire property has been restored to the stockholders. Control of the reorganized company has been secured by the Cutler-Hammer Mfg. Company, Milwaukee, Wis., well-known manufacturer of battery charging rheostats and other electric controlling devices. The plant of the National Battery Company will remain at Buffalo, but the business will be conducted under new management and with ample capital.

The Lima Insulator Company, Lima, N. Y., has not yet ascertained what machinery it will have to replace in its plant which was recently burned.

The Doehler Die Casting Company, recently incorporated with a capital stock of \$20,000, in which William J. Leddell, 18 Broadway, New York, is interested, is a reorganization of the Doehler Brake Beam Mfg. Company.

The Kosmos Portland Cement Company, Louisville, Ky., whose plant at Kosmosdale was recently damaged by fire, will not require any new machinery and will buy the repair parts for the damaged machinery from the makers of the different machines.

Bids will be received until September 28 by the City of Decatur, Ill., on the construction of two reinforced concrete intakes and the furnishing of 225 tons of cast iron pipe and special castings; also 15 valves ranging in size from 6 to 30 in.

The Pittsburgh Gage & Supply Company, Pittsburgh, has received a contract for the building of a high-pressure steam line for the Provident Coal Company, St. Clairs, Ohio, and a similar outfit for the W. B. Skelly Coal Company, Export, Pa. The company has also received contracts for the installation of high-pressure steam lines and other equipment for the Allegheny General Hospital, and for the Monongahela Incline Company. The brass casting department of the company's plant is being operated double turn, and castings for engine and machine bearings are being made in large numbers. Other departments of the plant are being operated single turn.

W. J. Alford, 3521 Twenty-seventh street, North Birmingham, Ala., is in the market for a second-hand boring and turning mill, about 14 or 16 ft. swing.

The Century Brass Company, Cattaraugus, N. Y., has started an addition to its plant which will mean trebling the capacity. The improvements will include installation of new boilers, new engines and a complete line of the latest machinery. The present plant will be operated to its full capacity while the improvements are being made.

The John A. Roebling's Sons Company, Trenton, N. J., through United States Senator Frank O. Briggs of New Jersey, has purchased the plant of the Sherwood Metal Working Company, at Teall avenue and Canal street, Syracuse, N. Y. The company manufactures a patent metal frame window screen. The purchase price was not given out, but is understood to be considerably in excess of \$100,000. The Sherwood Metal Working Company was organized three years ago with a capital of \$300,000, with E. P. Chapman, president, and Albert A. Day of New York, secretary. E. P. Chapman will now assume the position of manager. Improvements will soon be taken up and the present capacity of the plant doubled.

The open hearth steel plant, bar mill and sheet mills of the American Rolling Mill Company, Middletown, Ohio, are running full, but its sheet mill plant at Zanesville, Ohio, is closed for lack of orders.

The Iron and Metal Trades

The Export Trade Reaching a Flourishing Condition.

A Large Sale of Sheet Bars Abroad.

A Banner Transaction in Pipe.

The export trade in Iron and Steel from this country has now reached normal proportions, and the outlook is for a development to a flourishing condition. The purchasing power of different foreign countries has been growing, notably in South Africa, where the Rand is doing better than ever before, and in the Argentine which has enjoyed ample crops.

During the past week there has been sold for export to Great Britain one block of 56,000 tons of Sheet Bars, for delivery during the next four months, at a satisfactory price.

In addition to former sales of Structural and other Rolled Material, there has been closed a contract for 30,000 tons of Shapes, &c., with a large Canadian manufacturing interest.

A 4000-ton lot of Structural Material has been placed in the Argentine, and South Africa has taken one block of 500 tons of Sheets, all of one size.

The Pig Iron markets are quiet in all sections except in eastern Pennsylvania. We note sales of Basic Pig aggregating probably not less than 35,000 to 40,000 tons, of which one interest took 16,000 tons for delivery during the first quarter of next year, at \$16, and another purchased one block of 10,000 tons for this year's delivery. Other lots were sold, including one for shipment during the first half of next year. There has also been some selling of both Southern and Northern Pipe Irons, aggregating 6000 tons, at \$15.50 and \$16, delivered.

Southern makers, being pretty well booked up for the balance of the year, are holding their position as to next year's deliveries, which buyers are not yet willing to meet.

In manufactured Iron and Steel the banner order of the week has been that calling for 20,000 tons of Steel Pipe for the Columbia Gas & Electrical Company, a line which is to convey natural gas from the West Virginia fields to Cincinnati.

The Steel Rail trade continues very quiet, but there is an inquiry in the market for 28,000 tons. The large business pending in Canada is still in abeyance, with some danger that it will not come out for some time to come.

The St. Paul order is for 5000 cars, which have not yet been awarded. The Carolina, Clinchfield & Ohio Railroad is inquiring for 2000 cars. It is reported that some further Harriman cars have been given out.

While the outlook for Structural Material is promising—Chicago reports 80,000 tons of live projects for bridges and buildings—the actual business closed is not large. It includes 2000 tons for the Pennsylvania Hackensack bridge. The Hoyt apartment building in this city calls for 7000 tons.

Pittsburgh and Philadelphia report a slightly weaker market in Old Material. The situation is somewhat peculiar. In the East the stocks are comparatively small. In Chicago they are large, but they are held by strong parties.

The selling agencies are doing little in the way of selling Copper. They are, in fact, not meeting the market, made by second hands. Both the supply and the demand at 13½c. to 13¾c., which may be called the market for electrolytic, are limited. The frequent reports of increased production from nearly all the leading districts are making consumers cautious. The conviction is growing that the output is increasing even more rapidly than the admitted moderate development of consumption.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

Sept. 23, Sept. 16, Aug. 26, Sept. 25,

PIG IRON , Per Gross Ton:	1908.	1908.	1908.	1907.
Foundry No. 2, Standard, Philadelphia	\$16.75	\$16.75	\$16.50	\$20.25
Foundry No. 2, Southern, Cincinnati	15.75	15.75	15.50	21.75
Foundry No. 2, Local, Chicago	16.50	16.50	17.00	22.50
Basic, delivered Eastern Pa.	16.00	15.25	15.00	18.75
Basic, Valley Furnace	14.25	14.50	14.50	20.50
Bessemer, Pittsburgh	15.90	15.90	15.90	22.90
Gray Forge, Pittsburgh	14.40	14.40	14.65	20.90
Lake Superior Charcoal, Chicago	19.50	19.50	19.50	26.50

BILLETS, &c., Per Gross Ton:

Bessemer Billets, Pittsburgh	25.00	25.00	25.00	29.50
Forging Billets, Pittsburgh	27.00	27.00	27.00	33.00
Open Hearth Billets, Phila.	26.20	26.20	26.20	31.00
Wire Rods, Pittsburgh	33.00	33.00	33.00	36.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:

Steel Rails, Melting, Chicago	14.75	15.00	14.25	17.00
Steel Rails, Melting, Phila.	15.00	15.25	14.50	16.75
Iron Rails, Chicago	18.00	18.00	16.75	20.25
Iron Rails, Philadelphia	20.50	20.50	20.00	20.50
Car Wheels, Chicago	15.25	15.25	16.00	24.50
Car Wheels, Philadelphia	15.00	15.00	15.00	23.00
Heavy Steel Scrap, Pittsburgh	14.25	14.25	14.50	17.00
Heavy Steel Scrap, Chicago	13.00	13.00	13.00	14.75
Heavy Steel Scrap, Philadelphia	15.00	15.25	14.50	16.50

FINISHED IRON AND STEEL,

Per Pound:

	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.45	1.45	1.40	1.75
Common Iron Bars, Chicago	1.50	1.50	1.50	1.78
Common Iron Bars, Pittsburgh	1.40	1.40	1.40	1.70
Steel Bars, Tidewater, New York	1.56	1.56	1.56	1.81
Steel Bars, Pittsburgh	1.40	1.40	1.40	1.60
Tank Plates, Tidewater, New York	1.76	1.76	1.76	1.86
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.70
Beams, Tidewater, New York	1.76	1.76	1.76	1.86
Beams, Pittsburgh	1.60	1.60	1.60	1.70
Angles, Tidewater, New York	1.76	1.76	1.76	1.86
Angles, Pittsburgh	1.60	1.60	1.60	1.70
Skelp, Grooved Steel, Pittsburgh	1.45	1.45	1.45	1.85
Skelp, Sheared Steel, Pittsburgh	1.50	1.50	1.50	1.95

SHEETS, NAILS AND WIRE,

Per Pound:

	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.50
Wire Nails, Pittsburgh	1.95	1.95	1.95	2.05
Cut Nails, Pittsburgh	1.80	1.80	1.80	2.10
Barb Wire, Galv., Pittsburgh	2.40	2.40	2.40	2.50

METALS, Per Pound:

	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	13.75	13.75	13.62½	15.00
Electrolytic Copper, New York	13.57½	13.50	13.50	14.75
Spelter, New York	4.75	4.75	4.65	5.25
Spelter, St. Louis	4.60	4.60	4.50	5.15
Lead, New York	4.50	4.52½	4.57½	4.75
Lead, St. Louis	4.35	4.40	4.40	4.55
Tin, New York	28.75	28.55	29.25	37.15
Antimony, Hallett, New York	7.75	7.75	8.00	11.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	\$3.89	\$3.89	\$3.89	\$4.00

Chicago.

FISHER BUILDING, September 23, 1908.—(By Telegraph.)

A marked degree of interest naturally attaches at the present time to railroad operations necessitating the purchase of new materials, and for this reason the decision reached by the Chicago, Milwaukee & St. Paul Railroad to begin at once the construction of 5000 standard Steel underframe freight cars commands especial attention. It is officially stated that efforts will be made to have these cars ready for service within six months. Aside from the Steel underframes, contracts for which will be let outside, the cars will be built by the company at its Milwaukee shops. Specifications, it is stated, will call for Iron Axles. Generally speaking, last week was somewhat quieter than those immediately preceding, which is, perhaps, but an evidence of the extreme sensibility of commercial and industrial movements to influences largely sentimental in their nature. While the tonnage of fabricated material coming out is not large, there is enough business in sight to warrant the expectation of a turn for the better not far hence. Besides a total of 15,000 tons of bridge material which promises development before the end of the year, there is not less than 65,000 tons involved in live building projects in Chicago. A large part of this is nearly ready for figures, but in many cases there is an evident tendency to hold off when it comes to placing contracts. Fabricated work continues to be taken at extremely low prices. Bars, Sheets, Merchant Pipe and Wire Products represent the most active divisions of the market. While there is little doing in Billets, Plates and Boiler Tubes, a few orders for street railroad and traction

Rails and a moderate demand for Track Bolts and Spikes represent the measure of activity in these lines. In Light Rails a more satisfactory tonnage is being entered, the September orders of the Illinois Steel Company up to this time having reached 2700 tons. Iron Axles and Wrought Scrap are the strongest grades in Old Materials, the remainder of the list holding about stationary, with no special movement.

Pig Iron.—Practically no buying of Pig Iron, either for present needs or for future delivery, is going on, nor do the inquiries give much assurance of a determination among buyers to consider seriously purchases covering other than present requirements. No evidence is at hand pointing to immediate betterment in the condition of Northern Iron, but a radical recession from present prices seems unlikely in the face of present costs of production. At the same time, it is not wholly certain that on round lots of Northern Iron for last quarter delivery a slight shading from \$16.50, Chicago, could not be obtained. This price has at least been offered for No. 2 Foundry by Northern makers, although some carload business and slightly larger lots are being moved at \$17. Among sales of this character made during the week of a standard Northern brand are 600 tons and 300 tons, at \$17, for this year's delivery, and one lot of 200 tons for first quarter at \$17.50. The leading Southern furnaces have practically withdrawn from the market on 1908 tonnage, though their estimated output for this period is not entirely sold up. Under present conditions, however, it is impossible to realize \$13, Birmingham, which is generally held by these interests except on small lots required for mixture. The deadlock existing between producers and consumers on tonnage beyond the first of the year will have to be broken by concessions on one side or the other before there can be any contracting for future requirements. Shipments against contracts are said to be going forward according to schedule, with practically no hold-up orders, which would indicate a fair degree of activity in the foundries. A feature of favorable significance respecting the position of furnaces in this district is that there are said to be no unplanned overhanging stocks to retard recovery when it matures. *The following quotations are for early delivery, f.o.b. Chicago:

Lake Superior Charcoal.....	\$19.50 to \$20.00
Northern Coke Foundry, No. 1.....	17.00 to 17.50
Northern Coke Foundry, No. 2.....	16.50 to 17.00
Northern Coke Foundry, No. 3.....	16.00 to 16.50
Northern Scotch, No. 1.....	17.50 to 18.00
Southern Coke, No. 1.....	17.35 to 17.85
Southern Coke, No. 2.....	16.85 to 17.35
Southern Coke, No. 3.....	16.35 to 16.85
Southern Coke, No. 4.....	15.85 to 16.35
Southern Coke, No. 1 Soft.....	17.35 to 17.85
Southern Coke, No. 2 Soft.....	16.85 to 17.35
Southern Gray Forge.....	15.35 to 15.85
Southern Mottled.....	15.10 to 15.60
Malleable Bessemer.....	17.00 to 17.50
Standard Bessemer.....	17.65 to 18.10
Jackson Co. and Kentucky Silvery, 6 %	19.40 to 19.90
Jackson Co. and Kentucky Silvery, 8 %	20.40 to 20.90
Jackson Co. and Kentucky Silvery, 10 %	22.40 to 22.90

(By Mail.)

Billets and Rods.—Not much is doing in the way of new business in the Steel market. The general run of orders continues to represent incidental requirements, which call for small lots, carloads predominating. Moderate specifications from the leading forge shops are coming out, but the movement is restricted by lack of orders from heavy consumers, such as the railroads. The regular price of Forging Billets is \$28.50, base, Chicago. Specifications for Wire Rods are being offered in fairly satisfactory volume. Prices are unchanged, and we quote as follows: Bessemer, \$33; Basic, \$34; Chain, \$33, all at Pittsburgh.

Rails and Track Supplies.—Nothing of market interest has developed in Standard Rails, and no orders of any magnitude, either present or immediately prospective, have appeared; and there is scant likelihood of anything considerable being placed for early delivery. The Cambria Steel Company secured an order of 500 tons of street Rails from the Chicago Railways Company, and 800 tons of specifications from another traction interest. Quite a number of inquiries for Rails are being received from interurban and other traction lines, some of which concern new enterprises, but the greater number have to do with extension plans of existing lines. While very few of these have developed into orders, they indicate a revival of interest in plans, which in many cases have lain dormant since last year. The demand for Light Rails continues fairly satisfactory; the leading interest having, so far this month, booked 2700 tons. Last week's business in Track Supplies showed a slight quickening in movement, orders for 3000 kegs of Track Bolts and 1000 kegs of Spikes, having been included in the orders going to the Joliet Works. We quote as follows: Angle Bars, accompanying Rail orders, 1908 delivery, 1.50c.; car lots, 1.60c.; Spikes, 1.80c. to 1.90c., according to delivery; Track Bolts, 2.10c. to 2.15c., base, Square Nuts, and 2.25c. to 2.30c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 25 to 45 lb., \$26; 20-lb., \$27; 16-lb., \$28; 12-lb., \$29. Standard Sections, \$28, f.o.b. mill, full freight to destination.

Structural Material.—There is no lack of prospective business in the market, but much of the tonnage in sight is

slow in coming out. In Chicago alone 16 buildings, the majority of which have plans either in the hands of estimators or nearly ready to submit, will require an aggregate of at least 65,000 tons. It is expected that in the absence of any untoward developments a good part of this will reach the contract stage before the first of the year; but nearly all of the projects are of a character promising early consummation. The contracts closed by the American Bridge Company last week included 14,000 tons of material for railroad work and 700 tons for miscellaneous structures. It is stated that bids on the Keithsburg bridge, 6000 tons, will probably be submitted by the end of the month, and it is expected that about 9000 tons required for the construction of the McKinley bridge over the Mississippi River at St. Louis will be let about the middle of October. Plans for the Cook County Hospital, comprising several buildings in which 3000 tons of material will be used, are now in the hands of fabricators for figures. Other prospective buildings are the Northwestern University new gymnasium, and 500 tons for the Maurice L. Rothchild store building. A contract for about 1200 tons for the Scully Steel & Iron Company's new warehouse is reported to have been taken by the South Halstead Street Iron Works. Prices from store are 1.95c. to 2c. Mill prices at Chicago are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.78c.; Angles, 3 to 6 in., $\frac{1}{4}$ -in. and heavier, 1.78c.; larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 6 in. on one or both legs, 1.88c.; Beams, larger than 15 in., 1.88c.; Zees, 3 in. and over, 1.78c.; Tees, 3 in. and over, 1.83c.

Plates.—New business in Plates is light, and there are no definite indications of an increasing movement in this line. The principal users of Plates, such as car shops, shipyards and tank builders, are not yet in position to order or specify large tonnage, and outside of the small orders for miscellaneous requirements, which are not more numerous than they have been for some time, there is nothing of moment to record. A few mills seem willing to shade prices \$1.50 to \$2 a ton, aside from which the market is fairly firm at regular quotations. We quote mill shipments as follows: Tank Plates, $\frac{1}{4}$ -in. and heavier, wider than 6 $\frac{1}{4}$ and up to 100 in. wide, inclusive, car lots, Chicago, 1.78c.; 3-16 in., 1.88c.; Nos. 7 and 8 gauge, 1.93c.; No. 9, 2.03c.; Flange quality, in widths up to 100 in., 1.88c., base, for $\frac{1}{4}$ -in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.88c.; Flange quality, 1.98c. Store prices on Plates are as follows: Tank Plates, $\frac{1}{4}$ -in. and heavier, up to 72 in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in. up to 60 in. wide, 2.10c. to 2.25c.; 72 in. wide, 2.30c. to 2.40c.; No. 8, up to 60 in. wide, 2.10c. to 2.15c.; Flange and Head quality, 0.25c. extra.

Sheets.—The demand for fall requirements is responsible for a slight increase in the volume of new business. This is especially true of Galvanized Sheets, several fair sized orders for which have been recently placed for corrugated roofing. The Sheet department of the Inland Steel Company is now being operated at between 50 and 60 per cent. of its capacity. Some irregularity exists in prices, which are being cut \$1 to \$2 a ton by a few mills. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 1.98c.; No. 12, 2.05c.; No. 14, 2.08c.; No. 16, 2.18c.; Box Annealed, Nos. 17 to 21, 2.43c.; Nos. 22 to 24, 2.48c.; Nos. 25 and 26, 2.53c.; No. 27, 2.58c.; No. 28, 2.68c.; No. 29, 2.78c.; No. 30, 2.88c.; Galvanized Sheets, Nos. 10 to 14, 2.63c.; Nos. 15 and 16, 2.83c.; Nos. 17 to 21, 2.98c.; Nos. 22 to 24, 3.13c.; Nos. 25 and 26, 3.33c.; No. 27, 3.53c.; No. 28, 3.73c.; No. 30, 4.23c.; Black Sheets from store: Blue Annealed, No. 10, 2.15c.; No. 12, 2.20c.; No. 14, 2.25c.; No. 16, 2.35c.; Box Annealed, Nos. 18 to 21, 2.60c.; Nos. 22 to 24, 2.65c.; No. 26, 2.70c.; No. 27, 2.75c.; No. 28, 2.85c.; No. 30, 3.25c.; Galvanized from store: Nos. 10 to 16, 3c.; Nos. 18 to 20, 3.15c.; Nos. 22 to 24, 3.30c.; No. 26, 3.50c.; No. 27, 3.70c.; No. 28, 3.90c.; No. 30, 4.40c. to 4.45c.

Bars.—The majority of the tonnage now offered in Steel Bars is comprised of specifications against contracts placed early in the season. These continue to be offered with reasonable liberality, and the prospects are that the present month's output will run pretty close to that of August, which was the best of the present year. A few contracts are still being placed by the minor interests, but the aggregate tonnage of new business is very small. Nothing of importance has developed in the demand for Iron Bars, which is only moderate. Buyers generally insist upon prompt deliveries, and are keeping close to share in the matter of anticipating requirements. Quotations, Chicago, are as follows: Steel Bars, 1.58c., with half extras; Iron Bars, 1.50c.; Hoops, No. 13, and lighter, 1.98c., full extra Hoop card; Bands, No. 12 gauge, and heavier, 1.58c., half extra Steel Bar card; Soft Steel Angles and Shapes, 1.68c., half extras. Store prices are as follows: Bar Iron, 2c. to 2.15c.; Steel Bars, 1.90c. to 2c.; Steel Bands, 1.90c., as per Bar card, half extras; Soft Steel Hoops, 2.25c. to 2.35c., full extras.

Merchant Pipe.—Less fluctuation is seen in the demand for Pipe than in almost any other of the heavier mill products. Jobbers are apparently ordering, not with a view to

increasing stocks, but rather to provide for the actual necessities of present demand. Owing to the prompt shipments now available from mill, it is possible for them to rely upon quick execution of their orders, and hence there is no incentive to order very large stocks. The following mill discounts are quoted: Black Pipe, $\frac{3}{4}$ to 6 in., 73.2; 7 to 12 in., 70.2; Galvanized, $\frac{3}{4}$ to 6 in., 63.2. These discounts are subject to one point on the base. From store, in small lots, Chicago jobbers quote 73 per cent. on Black Steel Pipe, $\frac{3}{4}$ to 6 in. About three points above these prices is asked for Iron Pipe.

Boiler Tubes.—Merchant Tubes are extremely quiet. Many of the boiler shops, which ordinarily buy in carload or larger lots, are ordering from jobbers' stocks in small lots as occasion requires. More activity in railroad repair work is responsible for a moderate increase in orders for Seamless Tubes. Mill quotations for future delivery, on the base sizes, are as follows: $2\frac{1}{4}$ to $4\frac{1}{2}$ in., inclusive, Steel Tubes, 63.2; Iron, 50.2; Seamless, 50.2; $2\frac{1}{2}$ in. and smaller, and lengths over 18 ft., and $2\frac{1}{2}$ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to $1\frac{1}{2}$ in.	35	35	35
$1\frac{1}{4}$ to $2\frac{1}{4}$ in.	50	35	35
$2\frac{1}{2}$ in.	52 $\frac{1}{2}$	35	35
$2\frac{3}{4}$ to 5 in.	60	47 $\frac{1}{2}$	47 $\frac{1}{2}$
6 in. and larger.	50	35	"

Merchant Steel.—Implement makers, while specifying in slowly increasing volume, are ordering material only as it is needed for work in hand, and are not piling up stocks far in advance of requirements. New orders comprise but a small proportion of the business movement. Prospectively, conditions promise a material increase in business for the mills as soon as work on implements for spring delivery is well under way. We quote as follows: Planished or Smooth Finished Tire Steel, 1.78c.; Iron Finish, up to $1\frac{1}{2} \times \frac{1}{2}$ in., 1.73c., base, Steel card; Iron Finish, $1\frac{1}{2} \times \frac{1}{2}$ in. and larger, 1.58c., base, Tire card; Channels for solid Rubber Tires, $\frac{3}{4}$ to 1 in., 2.08c., and $1\frac{1}{4}$ in. and larger, 1.98c.; Smooth Finished Machinery Steel, 2.08c.; Flat Sleigh Shoe, 1.63c.; Convex and Concave Sleigh Shoe, 1.83c.; Cutter Shoe, 2.05c.; Toe Calk Steel, 2.13c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7 $\frac{1}{4}$ c. to 8c., and still higher prices are asked on special grades. Cold Rolled Shafting on contracts for 100 tons and over, 57 per cent. off; 56 per cent. off in car lots; 52 per cent. in less than car lots, on which carload freight is allowed within base territory.

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company was the low bidder on about 3500 tons of Pipe up last week for letting by the city of Cleveland, Ohio. Formal award of the contract has, however, not yet been made. Aside from this no individual transactions, including more than a few hundred tons, were included in the week's business. Orders of this character are fairly numerous, and in the aggregate furnish enough tonnage to keep the foundries reasonably active. Shortage of orders for a few sizes serves to sharpen competition, so that prices have not firmed up appreciably. Two small lots scheduled for early letting are 200 tons each for Hammond, Ind., and Holly, Colo. Prices are unchanged, which we quote nominally, per net ton, Chicago, as follows: Water Pipe, 4 in., \$27; 6 to 12 in., \$26; 16 in. and up, \$25, with \$1 extra for Gas Pipe.

Metals.—A decline of about $\frac{1}{4}$ c. in Copper is said to be due to the unloading of stocks by some of the outside mining interests. As a result of the break, buying has been slightly stimulated though no large lots were taken in this market, there being no disposition to stock ahead on the concession offered. Lead, Zinc and Spelter is in a little better demand, with prices unchanged and reasonably firm at present levels. Quotations are as follows: Casting Copper, 13 $\frac{1}{2}$ c.; Lake, 13 $\frac{3}{4}$ c. to 14c., in car lots for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{3}{4}$ c. higher; Pig Tin, car lots, 32 $\frac{1}{2}$ c.; small lots, 34 $\frac{1}{2}$ c.; Lead, Desilverized, 4.60c. to 4.65c., for 50-ton lots; Corrodizing, 4.85c. to 4.95c., for 50-ton lots; in car lots, 2 $\frac{1}{4}$ c. per 100 lb. higher; Spelter, 4.80c.; Cookson's Antimony, 10 $\frac{1}{2}$ c., and other grades, 9 $\frac{1}{2}$ c. to 10 $\frac{1}{4}$ c.; Sheet Zinc is \$7. f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 13 $\frac{1}{2}$ c.; Heavy Copper, 13 $\frac{1}{2}$ c.; Copper Bottoms, 12c.; Copper Clins, 13 $\frac{1}{2}$ c.; Red Brass, 12c.; Yellow Brass, 9 $\frac{1}{2}$ c.; Light Brass, 7c.; Lead Pipe, 4.30c.; Zinc, 3 $\frac{1}{4}$ c.; Pewter, No. 1, 21c.; Tin Foil, 23c.; Block Tin Pipe, 25c.

Old Material.—So far as values are concerned the Scrap market, with the exception of two or three grades, is practically stationary. Consumers are buying as their needs demand, which, judging from the tonnage moved, are neither insistent nor for lots of considerable tonnage. Old Iron Axles have developed unexpected strength, which is likely due to anticipated requirements in connection with prospective car orders in which the specification of Iron Car Axles are expected. Wrought Scrap continues firm; a lot of 500 tons offered on a railroad list closed last week brought \$14, or better. The real strength of the market lies, not so much in vigorous demand, as in the comparatively small tonnage being offered by the railroads. Dealers are of the opinion that, because of the small amount of replacements in cars and track made by the roads, no large

increase in the present rate of supply from this source can be reasonably expected through the remainder of the year. None of the local mills seem to be actively in the market for Rerolling Steel Rails, and this is apparently confirmed by the lack of buoyance in prices of this material. The Chicago, Burlington & Quincy is offering a list of 3400 tons this week, in which there are 1100 tons of Nos. 1 and 2 Wrought. We quote the following prices, f.o.b. Chicago, per gross ton:

Old Iron Rails.....	\$18.00 to \$18.50
Old Steel Rails, rerolling.....	16.00 to 16.50
Old Steel Rails, less than 3 ft.....	14.75 to 15.75
Relaying Rails, standard sections, subject to Inspection.....	20.00 to 21.00
Old Car Wheels.....	15.25 to 15.75
Heavy Melting Steel Scrap.....	13.00 to 13.50
Frogs, Switches and Guards, cut apart.....	13.50 to 14.00
Mixed Steel.....	10.25 to 10.75

The following quotations are per net ton:

Iron Fish Plates.....	\$17.00 to \$17.50
Iron Car Axles.....	20.00 to 20.50
Steel Car Axles.....	17.50 to 18.00
No. 1 Railroad Wrought.....	14.00 to 14.50
No. 2 Railroad Wrought.....	13.00 to 13.50
Railway Springs.....	13.00 to 13.50
Locomotive Tires, smooth.....	13.25 to 13.75
No. 1 Dealers' Forge.....	10.25 to 10.75
Mixed Busheling.....	8.00 to 8.50
Iron Axle Turnings.....	6.75 to 7.25
Soft Steel Axle Turnings.....	6.75 to 7.25
Machine Shop Turnings.....	6.75 to 7.25
Cast Borings.....	5.50 to 6.00
Mixed Borings, &c.	5.75 to 6.25
No. 1 Mill.....	8.00 to 8.50
No. 2 Mill.....	7.00 to 7.50
No. 1 Boilers, cut to Sheets and Rings.....	8.50 to 9.00
No. 1 Cast Scrap.....	13.00 to 13.50
Stove Plate and Light Cast Scrap.....	11.50 to 12.00
Railroad Malleable.....	12.25 to 12.75
Agricultural Malleable.....	11.00 to 11.50
Pipes and Flues.....	9.75 to 10.25

St. Louis.

ST. LOUIS, September 21, 1908.

Both the leading manufacturers and the distributors of Steel, Iron and Metals report, with but few exceptions, a steady gain in the volume of transactions. The change for the better is the more marked if comparison is made with conditions which prevailed a few months ago. To this more favorable situation and outlook the railroads are contributing a goodly share. There are some large St. Louis structures, for the erection of which Eastern parties secured the contracts. This will result in the placing of orders for fabricating material for these buildings with Eastern interests direct.

Coke.—A fair demand is noted for Coke and prices are strong, but quotably unchanged. It is reported that Connellsville interests are fighting shy of contracts for the first half of 1909, based on current prices, and offers of \$2.50, f.o.b. oven, are not always accepted. It is said that one of the largest companies in that section will not consider contracts for shipment over a period of one year pending the result of the national election. We quote \$2.25 to \$2.50, f.o.b. Connellsville, for 72-hr. Foundry Coke. The lower price is for prompt and the higher price for deferred shipment. The weakness in the East tends to make buyers cautious.

Pig Iron.—So far as large sales are concerned, at the close of the week there is not much actual business doing. One of the leading agents reports sale of 2000 tons of No. 2 Foundry to one of the largest St. Louis foundries, shipment over balance of this year. Another house also sold early in the week 1000 tons for shipment over first quarter of 1909, and a small order (150 tons) was placed at \$14, for shipment over first quarter of 1909. A third concern reports a sale of 1000 tons of No. 2 Foundry for the first quarter of 1909. It is rumored there has been some resale Iron (a few hundred tons) offered at \$12.75. There is still a pronounced disposition on the part of Southern furnaces not to make firm offerings for 1909. Inquiries both for fourth quarter of 1908 and first quarter of 1909 are fairly numerous with all the leading sellers. We quote, f.o.b. Birmingham, for No. 2 Foundry, \$13 for balance of this year and \$13.50 for first quarter of 1909.

Finished Iron and Steel.—The buying of Structural Steel must necessarily be confined to small buildings in the near future, since the contracts for some important structures were secured by Eastern parties, who will place their orders direct. The demand from railroads continues to improve and covers all kinds of material which enter into track and equipment repair work.

Lead, Spelter, &c.—Lead is ruling quiet, at 4.40c. to 4.42 $\frac{1}{2}$ c. Some brands are held higher. Lead Ore is easier. Zinc Ore is strong, at \$38.50, Joplin basis, which points to a stronger Spelter market as soon as consumers realize this figure is beyond a parity. There is a good business being done, and stocks in the hands of producers are rapidly decreasing. We quote 4.65c. to 4.70c., St. Louis, according to deliveries. While the Brass trade is beginning to come into the market, the best demand is for galvanizing purposes.

Old Material.—The market for Old Material is doing better both in price and in demand, a large mill having increased its purchases. There are no offerings from the railroads to report this week. While some kinds of Scrap Iron have advanced, and prices of other kinds remain unchanged, but firm. We quote as follows per gross ton, f.o.b. St. Louis:

Old Iron Rails.....	\$16.50 to \$17.00
Old Steel Rails, rerolling.....	15.50 to 16.00
Old Steel Rails, less than 3 ft.....	14.25 to 14.75
Relaying Rails, standard sections, subject to inspection.....	22.50 to 23.50
Old Car Wheels.....	15.00 to 15.50
Heavy Melting Steel Scrap.....	13.50 to 14.00
Frogs, Switches and Guards, cut apart.....	13.50 to 14.00
Mixed Steel.....	11.00 to 11.50

The following quotations are per net ton:

Iron Fish Plates.....	\$15.50 to \$16.00
Iron Car Axles.....	18.50 to 19.00
No. 1 Railroad Wrought.....	13.50 to 14.00
No. 2 Railroad Wrought.....	12.50 to 13.00
Railway Springs.....	13.00 to 13.50
Locomotive Tires, smooth.....	13.00 to 13.50
No. 1 Dealers' Forge.....	11.50 to 12.00
Mixed Borings, &c.....	5.50 to 6.00
Machine Shop Turnings.....	8.00 to 8.50
No. 1 Boilers, cut to Sheets and Rings.....	9.50 to 10.00
No. 1 Cast Scrap.....	12.00 to 12.50
Stove Plate and Light Cast Scrap.....	10.50 to 11.00
Railroad Malleable.....	11.00 to 11.50
Agricultural Malleable.....	10.00 to 10.50
Pipes and Flues.....	8.75 to 9.50

The leading manufacturers of Brass state that August was their best month this year, and a better demand is coming from railroads than during the first half of 1908. Last month their sales of Solder and Babbitt Metal were larger than for the same month last year. The inquiry for Nonferrous Metal is not up to last year, though the demand is better than it was.

The H. A. Fuller Iron & Steel Company, a newly organized company, has taken offices in the Third National Bank Building. It represents the J. C. Pearson Company, Boston, cement nails; Pittsburgh Screw & Bolt Company; Fort Pitt Forge Company, rivets, upsets, &c., and Keystone Nail Company.

The Adreon Mfg. Company announces the formation of the company by E. L. Adreon, Jr., D. H. Niedlander and Wm. Miller, for the purpose of manufacturing and selling railroad supplies. The home office of the company will be in the Security Building, St. Louis, and Mr. Miller, vice-president, will have charge of the Chicago office in room 300, Western Union Building.

Philadelphia.

PHILADELPHIA, PA., September 22, 1908.

The market continues rather quiet, and transactions in the majority of cases have been on a conservative basis. Buyers in many instances are marking time pending something more definite in the Presidential campaign, and, business it is believed, will be conducted along somewhat narrow lines until after the election. Purchases of Foundry Pig Iron of the higher grades have not been quite so heavy, but a comparatively good sale of Basic Iron for 1909 delivery has been made at an advanced price, with more business pending. Finished materials have not been quite so active, although there is a better tone to the market. The orders placed with local shipbuilders for four torpedo boat destroyers by the Government, at an aggregate cost of \$2,658,000, will lead to some fair business in Plates and Shapes, while some other good business is under consideration. Haddonfield, N. J., is asking for bids on 11 miles of Water Pipe, it being undecided whether Cast Iron or Steel will be adopted for use in connection with a new municipal water plant. Structural Material, Billets, Sheets and Bars are just about holding their own, while the Old Material market, in the continued absence of business, is a trifle weaker. The drought is being felt to some extent in this section, but has not as yet seriously affected the trade.

Pig Iron.—Current business in the leading Foundry grades has been rather light. A good volume of inquiries for deliveries during the last quarter and first quarter of the year are before the trade, but actual orders for any material tonnage do not come out freely. Taken over an average period of a month, however, the volume of business in Pig Iron shows a very material increase. At the recent monthly meeting of the Eastern Pig Iron Association it developed that some furnaces had increased their tonnage of unfilled orders very largely, while others reported a steady and gradual gain in the business taken in the various grades and makers are encouraged with the prospects. On some grades, notably Forge and Basic Iron, a number of producers have booked all the tonnage they can take care of during the remainder of the year, with the present capacity in blast; and while there has been and is still a disposition shown on the part of some sellers to refuse to quote for next year, others have taken some fair lots during the week, particularly for Basic. Stocks on furnace banks are reported decidedly less, and some producers can just about hold their own with their present production, and in one or two cases admit that they

are falling slightly behind in their deliveries. There seems to be no disposition to put in blast any further capacity beyond that recently announced, it being contended that prices have not yet reached a level where such action would yield a profit to the producer. There has been a decided stiffening in the prices of all the Foundry grades, as well as on Basic and Forge Irons, and sales have been pretty freely made at advanced prices. Sales of standard Foundry Irons during the week have been for the most part in small lots for prompt delivery. Full prices, however, are being received and sales of lots of 25 to 100 tons for shipment in the next 30 or 60 days are freely reported at \$16.75 to \$17, delivered, for No. 2 X Foundry, and these prices will apply in the majority of cases for delivery over the balance of the year, and while some sellers are asking 25c. above the top range for that grade, they as a rule fail to get the business. Several fairly good sales of No. 2 Plain Foundry Iron, for delivery in the last quarter, have also been reported at prices ranging from \$16.50 to \$16.75, delivered. Low grade Irons for delivery during the remainder of the year have been more actively taken during the week, and sales aggregating 3500 tons of Northern Iron at prices ranging from \$15.50 to \$15.65, and one lot of 2500 tons of No. 3 Southern Iron, on a basis of \$12.50, Birmingham, for No. 2 were taken by a local Pipe foundry; while other inquiries aggregating several thousand tons of Pipe Iron are still before the trade. Southern Iron has not been very active, as outside the above noted sale transactions have been in rather small lots, for prompt shipment on the \$13 Birmingham basis for No. 2 Foundry. Virginia Foundry Irons have been rather quiet. Recent sales have been in small lots for spot shipment at recently quoted prices. More activity has developed in Forge Iron, and sales of several small lots, with one of 500 tons and another of 1000 tons, are reported at prices ranging from \$15.50 to \$15.75, delivered. Basic Iron for delivery over the balance of the year is scarce and commands higher prices. Makers are pretty well covered as far as their capacities for the third quarter are concerned and are holding their Iron at \$16 for such delivery. The policy of withholding quotations for this grade for the first quarter of next year has been abandoned, and sellers are now freely quoting \$16. Buyers have been awaiting this move for some time, and have been frequent inquirers heretofore without result. That they were willing to come into the market as soon as a reasonable price was quoted is evidenced by a sale of 16,000 tons at the price named to an Eastern Steel mill a few days ago, while other business is pending. Low Phosphorus Iron is dull, the demand is light and prices can hardly be termed strong at the quoted figures. The situation on the whole continues strong. Sellers are not forcing business, while buyers, though making numerous inquiries, are not covering themselves for any great period ahead. Prices are being firmly maintained, and there appears to be a gradual upward tendency due to slightly better consumption. For delivery in buyers' yards the following range of prices is quoted for shipment over the balance of the year, except for the Virginia grades, which are for prompt shipment:

Eastern Pennsylvania, No. 2 X Foundry.	\$16.75 to \$17.00
Eastern Pennsylvania, No. 2 Plain.	16.25 to 16.50
Virginia, No. 2 X Foundry.	17.00
Virginia, No. 2 Plain.	16.75
Gray Forge.	15.50 to 15.75
Basic.	16.00
Low Phosphorus.	20.00 to 20.50

Ferromanganese.—The demand continues rather light. Some small tonnage has been sold, and prices show a somewhat smaller range. Quotations for deliveries covering the first half of next year range from \$43 to \$44, Baltimore, with spot lots probably a shade less.

Plates.—The business coming out shows no material improvement, and mills have been just about able to maintain their current rate of production. The outlook is more encouraging. A considerable tonnage of Plates will develop from the shipyards, to cover recent contracts for torpedo boat destroyers, while several Steel water Pipe propositions, which will require a considerable tonnage of Plates, are pending. Prices are being strongly maintained, and are quoted as follows, for delivery in this territory:

Parts	Carloads, carload.	Cents.	Cents.
Tank, Bridge and Boat Steel.	1.75	1.80	
Flange or Boiler Steel.	1.85	1.95	
Commercial Firebox.	1.95	2.00	
Marine.	2.15	2.20	
Locomotive Firebox Steel.	2.25	2.30	
The above are base prices for 1/4-in. and heavier. The following extras apply:			
3-16-in. thick.		\$0.10	
Nos. 7 and 8, B. W. G.		.15	
No. 9, B. W. G.		.25	
Plates over 100 to 110 in.		.05	
Plates over 110 to 115 in.		.10	
Plates over 115 to 120 in.		.15	
Plates over 120 to 125 in.		.25	
Plates over 125 to 130 in.		.50	
Plates over 130 in.		1.00	

Steel Billets.—No particular change is to be noted in the demand. Business continues of a day to day character, but is sufficient to maintain about an even production. For

delivery in this territory Ordinary Rolling Steel is quoted at \$26.20, and Forging Steel, \$28.20, subject to the usual extras for high carbons and special sizes.

Structural Material.—The tonnage recently placed has not been large, and the local demand has been confined largely to miscellaneous lots. The McClintick-Marshall Company has taken a contract for a small bridge near Pottstown, Pa., but the larger propositions recently figured on are being held in abeyance. Prices are unchanged, 1.75c. to 1.90c. being quoted, according to specifications, for deliveries in this territory.

Sheets.—Business has been somewhat irregular, but, in the aggregate, averages up fairly well. Buying still continues on a small scale, and orders are mostly for prompt shipment. Prices are unchanged, and range as follows, for mill shipment, a tenth extra being added for small lots: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 to 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The demand is hardly as good, buyers' requirements for immediate delivery being pretty well covered. Prices continue to be pretty firmly maintained, and 1.40c., at Eastern mill, is a fairly well established price for Refined Iron Bars, equal to 1.45c. to 1.50c., delivered. Production, while irregular, continues on a fairly even basis. Steel Bars are dull, at 1.55c., delivered, with Rerolled Bars at 1.50c., delivered in this territory.

Coke.—Sales have been small, and the market shows little activity. Spot Coke is not being as freely offered as it was, and such business as has been reported in contract Coke has been done at unchanged price. Foundry Coke is quoted \$2 to \$2.25, at oven, with Furnace Coke ranging from \$1.50 to \$1.75. For delivery in this territory, the following range of prices is named:

Connellsburg Furnace Coke.....	\$3.65 to \$3.90
Foundry Coke.....	4.15 to 4.40
Mountain Furnace Coke.....	3.25 to 3.50
Foundry Coke.....	3.75 to 4.00

Old Material.—The market appears to be a shade weaker. Melters still hold at former offers of \$15 for Heavy Melting Steel, but while sellers continue to ask an advance, their ideas are hardly as high as they were, and they would in some cases accept \$15.50 for prompt shipment of this grade. Mills offer from 25c. to 50c. less than sellers' prices for nearly all the leading grades, but no sales have been made at the lower price levels. Nominal quotations for prompt deliveries in buyers' yards, eastern Pennsylvania and nearby territory range about as follows:

No. 1 Steel Scrap and Crops.....	\$15.00 to \$15.50
Low Phosphorus.....	18.50 to 19.00
Old Steel Axles.....	21.50 to 22.00
Old Iron Axles.....	22.50 to 23.00
Old Iron Rails.....	20.50 to 21.00
Old Car Wheels.....	15.00 to 15.50
Choice No. 1 R. R. Wrought.....	18.25 to 18.75
Machinery Cast.....	15.25 to 15.75
Railroad Malleable.....	13.50 to 14.00
Wrought Iron Pipe.....	14.25 to 14.75
New Bundled Sheets.....	13.50 to 14.00
No. 1 Forge Fire Scrap.....	12.00 to 12.50
No. 2 Light Iron.....	8.75 to 9.25
Wrought Turnings.....	11.50 to 12.00
Stove Plate.....	13.00 to 13.50
Cast Borlings.....	11.25 to 11.75
Grate Bars.....	13.50 to 14.00

The Charles Dreifus Company, Iron and Steel merchant, will remove from its present offices, 1008-1009 North American Building, on October 1, having taken offices in the Pennsylvania Building, Fifteenth and Chestnut streets, rooms 501-2-3.

Pittsburgh.

PARK BUILDING, September 23, 1908.—(By Telegraph.)

Pig Iron.—The Pig Iron market has been exceedingly quiet in the past week. Work among the foundries and other consumers of Iron seems to be falling off instead of increasing, and this is naturally curtailing the consumption of Pig Iron, which has been light for many months. We also note that some large Western consumers of Pig Iron, who bought quite freely two or three months ago, are not taking the Iron out promptly, but have asked the furnaces to defer shipments. The Brier Hill Iron & Coal Company has about completed the rebuilding of its Grace Furnace, at Youngstown, and it will probably go in blast at an early date. The furnace will be able to make about 400 tons of Pig Iron per day. Two or three fairly large sales of Basic Iron were made about a week ago, but at concessions over former prices. We quote Standard Bessemer Iron at \$15, Malleable Bessemer \$14.50, Basic \$14.25 and No. 2 Foundry \$14.35 to \$14.50, all at Valley furnace, plus a freight rate of 90c. to Pittsburgh. Forge Iron is absolutely stagnant, and is nominally \$13.50, at Valley furnace.

Steel.—It is said that Billets are moving out a little more freely on specifications against contracts, but this is offset by the falling off in the demand for both Sheet and Tin Bars, especially in the latter, due to the fact that the Tin Plate trade for this year is about over, and the Tin

Plate mills are running to about only 40 per cent. of their capacity. The Bessemer plant of the Republic Iron & Steel Company, which was down last week, started up on Sunday night, September 20, and has a fair run of orders ahead. While regular prices on Billets and Sheet and Tin Bars are being maintained, most consumers have sliding scale contracts, by which they get their Steel at less than regular prices. We quote Bessemer and Open Hearth Billets, 3% in. and larger, up to and including 0.25 carbon, \$25; 0.26 to 0.60 carbon, \$1 extra; over 0.60 carbon, \$2 extra, all f.o.b. Pittsburgh. For Wheeling, Martins Ferry, Follansbee, Newcastle, Sharon, Steubenville and Washington (Pa.) delivery, half the freight, or 50c. additional, is charged. Sheet and Tin Bars in random lengths are \$27, f.o.b. Pittsburgh. Forging Billets take \$2 advance over Rolling Billets.

(By Mail.)

So far as new business and specifications against contracts are concerned, the Steel trade so far in September has not been as good as in the first half of August, and it is not believed that when this month is closed it will make a favorable comparison with last month. This condition is largely ascribed to the fact that the election is only six weeks away, and there is a decided tendency on the part of the trade to hold off buying until after the result is known. Numerous reports are in circulation of cutting on practically all lines of Finished Iron and Steel, but when these are sifted down it is usually found that concessions are being made by some of the small mills on orders for spot shipment, but with the larger Steel interests the market is being pretty well held. Pig Iron has been exceedingly dull, and prices are weak, with hardly enough new business being offered to test the market thoroughly. There are no changes in the situation in the Valley furnaces, the output running from 12,000 to 13,000 tons per week, the merchant furnaces reporting stocks of about 60,000 tons. These do not include Iron held in the yards of the Youngstown Sheet & Tube Company and the Republic Iron & Steel Company, both having a good deal of metal on hand. Bessemer Pig Iron continues to rule at \$15, at Valley furnace, but Basic is lower, and in the past week several round lots have sold at \$14.25. Northern No. 2 Foundry Iron is held by most sellers at \$14.50, at Valley furnace, but on some orders recently closed \$14.35 to \$14.40 was done. Consumers of Billets are taking out a little more Steel on contracts, but not much new business is offering. A leading consumer of Tin Bars has recently practically covered his requirements for some time ahead. There is a good deal of inquiry for Structural Material, and a fair amount is being placed, but it is now so late in the year that it is probable that some large jobs that were expected to come out will go over until next year. The demand for Sheets is reported to be slightly better, but some shading is being done in prices, and this is also true of Tin Plate. The Coke trade continues very dull, with no betterment in prices, and only a small amount of Old Material is changing hands, with prices about the same as last week.

Ferromanganese.—Most consumers are pretty well covered and the inquiry is light. A few who bought pretty freely of Ferro early in the year are offering some of it for resale. We quote 80 per cent. foreign Ferro at \$43, seaboard, equal to \$43.95, Pittsburgh.

Ferrosilicon.—No sales have been reported in this district for some time. We quote 50 per cent. at \$57.50, Pittsburgh.

Muck Bar.—The dull condition of the Bar Iron trade is reflected in Muck Bar, and no sales are reported. We quote best grades, made from all Pig Iron, at nominally \$25, Pittsburgh.

Wire Rods.—A fair amount of inquiry is reported, but a number of consumers bought pretty freely some time ago, and now have their requirements pretty well covered for the rest of this year. We quote Bessemer Rods at \$33, Basic, \$34, and Chain Rods, \$33, Pittsburgh.

Skelp.—Not much new tonnage in Skelp is being bought in the general market, most of the leading Pipe mills making their own supply. A local mill that rolls Skelp for the general market has done very little for some months. We quote: Grooved Steel Skelp, 1.45c. to 1.50c.; Sheared Steel Skelp, 1.50c. to 1.60c.; Grooved Iron Skelp, 1.60c. to 1.70c., and Sheared Iron Skelp, 1.70c. to 1.75c., f.o.b. Pittsburgh.

Steel Rails.—The market on standard sections is very dull, but a few scattering specifications are coming in for small lots. The demand for Light Rails is fairly active, the Carnegie Steel Company having taken orders for about 2000 tons in the past week. Prices on Light Rails seem to be firmer, and rerolling Rail mills are adhering more closely to the prices named on new Rails than for some time. The Carnegie Steel Company is operating Nos. 1 and 2 Edgar Thomson mills to about 35 per cent. of capacity, the heavier Sections from 70 lb. to 100 lb. being rolled on No. 1, and medium Sections, from 40 lb. to 60 lb., on No. 2. On No. 3 mill Light Rails are rolled, and this mill has been closed for several weeks, but may possibly start next Sunday night. Prices on new Light Rails, which are sometimes shaded from \$1 to \$2 a ton for rerolled Rails, are as

follows: \$25 for 25 to 45 lb. Sections, with \$1 advance for 20 lb., \$2 advance for 16-lb., and \$3 advance for 12-lb. Standard Sections are \$28, at mill, and Angle Splice Bars, 1.65c., at mill.

Structural Material.—Some tonnage has been placed, and a fair amount of work is in sight. The bridge over the Monongahela River, at Monongahela City, Pa., on which the Fort Pitt Bridge Works was the lowest bidder, has not yet been placed, as Washington County, which was to pay about half the cost of the bridge, has had some trouble in placing its bonds. The Pittsburgh Steel Construction Company has taken about 200 tons for a new Masonic temple at Youngstown, 500 tons for a blast furnace and boiler house in the South, 1600 tons for the First National Bank building, this city, and 1500 to 2000 tons for a 12-story office building in Houston, Texas. The Pennsylvania Steel Company has taken 2000 tons for a Pennsylvania Railroad bridge at Hackensack, N. J. On September 30 the Iowa Central Railroad is expecting to award the contract for a bridge over the Mississippi River, 4000 tons, bids for which went in some time ago. The Jones & Laughlin Steel Company is now delivering to the McClintic-Marshall Construction Company some of the Steel for the Pittsburgh & Lake Erie bridge, at Beaver, Pa. It is intimated that prices of plain material are not being strictly held in all cases, some very low figures having recently been made for fabricated and erected work, which the price of 1.60c. on Beams and Channels would hardly allow. We quote, f.o.b. mill, Pittsburgh: I-Beams, H-Beams and Channels, 3 to 15 in., inclusive, 1.60c., net; Beams over 15 in., 1.70c., net; Angles, 3 to 6 in., inclusive, $\frac{1}{4}$ in. and up, 1.60c., net; Angles, over 6 in., 1.70c., net; Angles, 3 x 3 in. and up, less than $\frac{1}{4}$ in., 1.50c., base, half extras, Steel Bar card; Tees, 3 in. and up, 1.65c., net; Zees, 3 in. and up, 1.60c., net; Angles, Channels and Tees under 3 in., 1.50c., base, half extras, Steel Bar card; Deck Beams and Bulb Angles, 1.90c., net; Hand Rail Tees, 3c., net; Checked and Corrugated Plates, 3c., net.

Plates.—The general run of orders for Plates is light and is only for small lots for actual needs. The Steel car companies have not yet begun to specify for the Plates for the cars recently placed by the Harriman interests, but the Carnegie Steel Company is now rolling at its Homestead Works the Plates and Sheets for the two Ore boats recently ordered for the American Shipbuilding Company, and which are being shipped to Lorain. The 20,000 tons for the Brooklyn water works are still being held up by injunction, and the dispute may not be settled for some time. There is some unevenness in prices of Plates, some of the mills shading to the extent of \$2 a ton. Regular prices are as follows: Tank Plates, $\frac{1}{4}$ in. thick, 6 $\frac{1}{4}$ in. up to 100 in. wide, 1.60c., base, at mills, Pittsburgh. Extras over this price are as follows:

Tank, Ship and Bridge quality, $\frac{1}{4}$ in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered $\frac{1}{4}$ -in. Plate. Steel Plates over 72 in. wide must be ordered $\frac{1}{4}$ -in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel Plates over 72 in. wide ordered less than 11 in. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on Plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under $\frac{1}{4}$ -in. to and including 3-16-in. Plates on thin edges.....	.10
Gauges under 3-16-in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Firebox Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Locomotive Firebox Steel.....	.50
Shell grade of Steel is abandoned.	
For widths over 100 in. up to 110 in.....	.05
For widths over 110 in. up to 115 in.....	.10
For widths over 115 in. up to 120 in.....	.15
For widths over 120 in. up to 125 in.....	.25
For widths over 125 in. up to 130 in.....	.50
For widths over 130 in.....	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.50c., f.o.b. Pittsburgh.

Sheets.—The American Sheet & Tin Plate Company and most of the independent Sheet mills are able to operate to between 50 and 60 per cent. of capacity. The demand for Sheets is showing some betterment. While prices are fairly well maintained, they are sometimes shaded by a few mills, but mostly for prompt shipment. The American Sheet & Tin Plate Company has taken a contract for about 500 tons of Galvanized Sheets to be furnished the Pressed Steel Car Company. For shipment from mill, regular prices, which are shaded by some mills from \$1 to 2 a ton, are as follows: Blue Annealed Sheets, No. 10 and heavier, 1.80c.; Nos. 11 and 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 2c.; Box Annealed, Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; Nos. 27, 2.40c.; Nos. 28, 2.50c.; Nos. 29, 2.60c.; No. 30, 2.70c. Galvanized Sheets: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.65c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.70c.;

No. 30, 3.95c.; No. 28, Painted Roofing Sheets, \$1.75 per square, and Galvanized Roofing Sheets, No. 28, \$3.10 per square, for 2 $\frac{1}{2}$ -in. corrugations. These prices are subject to a rebate of 5c. per 100 lb. to the large trade under the usual conditions, jobbers charging the usual advances for small lots from store.

Tin Plate.—The Tin Plate trade for this year is practically over, and only a few scattering orders are being placed. The American Sheet & Tin Plate Company is operating to between 40 and 45 per cent. of capacity, and most of the independent mills are running at about the same rate. Competition for what little new business is coming up is keen, and prices are being shaded to some extent, but as yet this has not seriously disturbed the market. The regular price of Tin Plate, which is being shaded more or less, is \$3.70 for 100 lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, this price being subject to the usual rebate of 5c. per base box in large lots.

Hoops and Bands.—A moderate amount of new tonnage is being placed, and specifications against contracts are fair. It is stated that regular prices on Hoops and Bands are being fairly well maintained, as follows: Steel Hoops, 1.80c., base, full Hoop card prices; Steel Bands, 1.40c., base, half Steel card extra, all f.o.b. cars, Pittsburgh, in carload lots, for delivery during 1908.

Bars.—A fairly active movement is reported in Steel Bars, some new orders being placed, and specifications against contracts are coming in quite freely. The leading makers—Carnegie, Jones & Laughlin, and Republic—are operating their Bar mills to fuller capacity than for some time, and shipments are correspondingly heavy. The demand for Iron Bars is only fair, and is confined mostly to small lots for urgent needs, specifications against contracts coming in rather slowly. We quote Iron Bars at 1.40c., base, for Pittsburgh delivery, and 1.35c., base, for Western points, to which freight is added, except Chicago, the price for which is 1.50c., delivered. We quote Steel Bars at 1.40c., Pittsburgh, for base sizes.

Merchant Steel.—A fairly active demand is noted for Hot and Cold Rolled Shafting, and some good sized contracts have lately been placed for delivery over the balance of this year and into next year. Prices are fairly strong, but on desirable tonnage the official price of 57 per cent. off in carloads has been shaded two or three points. Specifications against contracts for Merchant Steel are fairly active, but very little new business is being placed. We quote Cold Rolled Shafting at 57 per cent. off in carloads and 52 per cent. in less than carloads, delivered in base territory, but the lower price is being shaded on desirable orders. Prices on Merchant Steel are also being shaded, regular quotations being as follows: Smooth Finished Machinery Steel, 1.80c. to 1.90c.; Flat Sleigh Shoe, 1.75c. to 1.85c.; Cutter Shoe Steel, 2.15c. to 2.25c.; Toe Calk, 1.90c. to 1.95c.; Railroad Spring Steel, 1.60c. to 1.75c., the higher prices being for Pennsylvania Railroad analysis. Carriage Spring Steel is 1.80c.; Tire Steel, Iron finish, 1 $\frac{1}{2}$ x $\frac{1}{2}$ in. and heavier, 1.40c.; under 1 $\frac{1}{2}$ in., 1.55c. Planished Tire Steel is 1.60c., all f.o.b. at mill.

Merchant Pipe.—An inquiry is in the market for 4 miles of 2-in. Pipe for delivery to Chicora, Pa., and a similar inquiry for 4 miles of 2-in. for delivery to West Virginia. There is a good general run of orders for Merchant Pipe, and new business seems to be slowly increasing. Prices on Steel Pipe are being maintained by the leading mills, but are sometimes slightly shaded by several of the smaller mills for prompt shipment. Discounts on Iron Pipes are also being shaded, and the market is not as strong as on Steel. Discounts on Steel Pipe, $\frac{1}{4}$ to 6 in., to the large trade are 76 and 5 per cent. off list. Regular discounts are as follows:

Merchant Pipe.		
	Jobbers, carloads, Steel.	Black. Galv.
	%	%
$\frac{1}{8}$ to $\frac{1}{4}$ in.	.67	.51
$\frac{3}{8}$ in.	.69	.55
$\frac{1}{2}$ in.	.71	.59
$\frac{3}{4}$ to 6 in.	.75	.65
7 to 12 in.	.72	.57
Extra strong, plain ends:		
$\frac{1}{8}$ to $\frac{1}{4}$ in.	.60	.48
$\frac{1}{2}$ to 4 in.	.67	.55
$\frac{1}{2}$ to 8 in.	.63	.51
Double extra strong, plain ends:		
$\frac{1}{2}$ to 8 in.	.56	.45

Discounts on Genuine Iron Pipe are as follows:

	Black.	Galv.
	%	%
$\frac{1}{8}$ to $\frac{1}{4}$ in.	.65	.53
$\frac{3}{8}$ in.	.67	.57
$\frac{1}{2}$ in.	.69	.63
$\frac{3}{4}$ to 6 in.	.73	.55
7 to 12 in.	.70	.55
Extra strong, plain ends:		
$\frac{1}{8}$ to $\frac{1}{4}$ in.	.58	.46
$\frac{1}{2}$ to 4 in.	.65	.53
$\frac{1}{2}$ to 8 in.	.61	.49
Double extra strong, plain ends:		
$\frac{1}{2}$ to 8 in.	.54	.43

Railroad Spikes.—The Great Northern Railroad has bought a fairly large quantity of Spikes in standard sizes, from 2000 to 2500 kegs having been placed with two of the local mills. There is an active demand for the smaller sizes, and one local mill has work ahead for six to eight weeks. We quote: Standard sizes, 4½ x 9-16 in., at \$1.70, and the smaller sizes at \$1.80 per 100 lb. in carload and larger lots, with an advance of 5c. per 100 lb. for less than carload, f.o.b. Pittsburgh.

Spelter.—The market continues dull, and prices are weak. We quote prime grades at about 4.55c., East St. Louis, equal to 4.67½c., Pittsburgh. On a firm offer this price would likely be shaded.

Boiler Tubes.—The railroads are doing more repair work, and are buying Boiler Tubes a little more freely, but their orders are still in small lots for actual needs. Regular discounts on Merchant Tubes in small lots, on which an extra 5 per cent. is allowed in carloads, but which discounts are being shaded, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	.42	.47
1¾ to 2¼ in.	.42	.59
2½ in.	.47	.61
2¾ to 5 in.	.52	.65
6 to 13 in.	.42	.59
2½ in. and smaller, over 18 ft. long, 10 per cent. net extra.		
2¾ in. and larger, over 22 ft. long, 10 per cent. net extra.		

Iron and Steel Scrap.—The market is very quiet, large consumers being pretty well covered. In spite of the absence of buying, prices on most lines of Scrap are fairly strong, and as yet there is no disposition on the part of dealers to sacrifice values to effect sales. Dealers quote about as follows: Heavy Steel Scrap, for Pittsburgh, Sharon, Steubenville, Follansbee and Monessen delivery, \$14.25 to \$14.50, while Heavy Steel Scrap, for hand charged Open Hearth furnaces, and for pieces weighing 10 lb. minimum and 300 lb. maximum, is \$1 a ton higher; Cast Iron Borings, \$8.75 to \$9; Bundled Sheet Scrap, \$12.25 to \$12.50; No. 1 Cast Scrap, \$14.25 to \$14.50; No. 1 Railroad Wrought, \$15 to \$15.25; No. 1 Busheling Scrap, \$13.50 to \$14; No. 2, \$10 to \$10.25; Sheet Bar Crop Ends, \$17.50 to \$18; Iron Axles, \$22 to \$22.50; Steel Axles, \$19; Low Phosphorus Melting Stock, \$18.50 to \$19; Rerolling Rails, \$16 to \$16.25; Machine Shop Turnings, \$9.50 to \$9.75; Railroad Malleable, \$14; Grate Bars, \$12.25 to \$12.50; Old Car Wheels, \$14.50 to \$14.75, all in gross tons.

Coke.—This trade does not show any betterment, either in demand or prices, and until general conditions in the Iron trade improve it is unreasonable to expect better things in the Coke business. From 50 to 55 per cent. of the ovens in the Upper and Lower Connellsville regions are active, and the output is running about 190,000 tons per week. Best grades of Connellsville Furnace Coke, for prompt shipment, can still be had as low as \$1.50 a ton, at oven, while other grades of Furnace Coke have sold at \$1.40 a ton or less. For delivery through the balance of this year, Connellsville Furnace Coke is held at about \$1.65, and for first half of next year from \$1.75 to \$1.85 a ton, at oven. The long continued drought is affecting operations at the ovens to some extent, but this is not being as seriously felt as would be the case if the demand for Coke were heavier.

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Cincinnati.

CINCINNATI, OHIO, September 23, 1908.—(By Telegraph.)

The excessive heat of the past few days and the exciting political agitation seem to have seriously disturbed the Iron and Steel trade. Sellers of all kinds unite in the opinion that it is very dull. In finished lines there are some late specifications for architectural Steel, but otherwise they are very quiet. The Scrap markets are dead. There is a diversity of opinion as to conditions in the machinery trade. While with lathe and drill manufacturers it is abnormally quiet, and inquiries have fallen off, shapers, milling machines and planers are doing well. Large concerns here manufacturing the last named tools all report a very satisfactory business for the week.

Pig Iron.—Interest in Pig Iron the past week has centered in the doings of the Pipe, stove and agricultural implement manufacturers. The large Michigan interest, which was in the market for a heavy tonnage, has, it is understood, bought very recently 1000 tons of 3 to 4 per cent. Silvery from a Southern furnace at a price near \$17, delivered. A tonnage of Northern Iron purchased by the same consumer a few weeks ago is credited to a Toledo furnace, and it is understood it is still in the market for some straight Southern Foundry. The Ohio Pipe interest, which was last week in the market for a month's requirements, has instead bought something like 12,000 tons for delivery over the last quarter, and at a price said to average near \$15, delivered. A Cleveland furnace interest is credited with this sale, which included Nos. 2, 3 and 4 Foundry. A northern Ohio implement manufacturer has purchased 4000 tons of Basic for delivery into next year at a price of about \$14.50 from a Central

Ohio furnace interest, which had, it is understood, some close business relations with the manufacturer. A sale of Forge and Mottled in this market marks a new price on low grades. Two thousand tons, of which 1500 was Forge and 500 Mottled, went, it is understood, at a price of about \$11.50, Birmingham, for delivery over the balance of the year. The cutting by Eastern and Valley furnaces seems to have had an effect on Ohio Irons, for a disposition appears manifest to contract at from 25c. to 50c. less per ton than early September prices. A number of transactions, involving both small and large, nearby shipment, have been booked, it is understood, at \$14.50 and \$14.75 for No. 2, although many furnaces are holding for \$15 and even \$15.50. A Central Ohio manufacturer is asking for prices on 2000 tons of Malleable for the first half. This business is expected to be taken by Columbus. An Indiana agricultural implement manufacturer wants prices on 400 tons of Foundry Iron for the first half. It is understood that a Kentucky foundry, which was in the market for 500 tons of Virginia and Ohio and Southern Iron, has purchased a part, but is still feeling for better prices on the Southern product. For early delivery and balance of the year, we quote, f.o.b. Cincinnati, the freight rate being \$3.25 from Birmingham and \$1.20 from the Hanging Rock District, as follows:

Southern Coke, No. 1	\$16.25 to \$16.75
Southern Coke, No. 2	15.75 to 16.25
Southern Coke, No. 3	15.25 to 15.75
Southern Coke, No. 4	15.00 to 15.50
Southern Coke, No. 1 Soft	16.25 to 16.75
Southern Coke, No. 2 Soft	15.75 to 16.25
Southern Coke, Gray Forge	14.25 to 14.75
Ohio Silvery, 8 per cent. Silicon	19.70
Lake Superior Coke, No. 1	16.45 to 16.95
Lake Superior Coke, No. 2	15.95 to 16.45
Lake Superior Coke, No. 3	15.45 to 15.95
Standard Southern Car Wheel	22.25 to 22.75
Lake Superior Car Wheel	21.75 to 22.25

(By Mail.)

Coke.—Consumers are taking Coke on contract, but very little new business is coming out and the price is a little weaker on all Furnace products, with a very small volume reported on Foundry grades from any field. The continued drought has affected the smaller producer seriously, and ovens are being put out daily. Producers in the Virginia field are complaining that they cannot make Furnace Coke at a less price than \$1.85 net, and threaten to put out ovens if the market sags any below that figure. Some of the large producers announce that they are sold up to the first of the year and do not care for more business for the last quarter. It is possible to-day to get some grades of Wise County Furnace Coke at \$1.75 for spot delivery. Pocahontas is quotable at about \$1.50, at oven, and for the last quarter about \$1.65; Connellsville Furnace, prompt delivery, \$1.60, and for last quarter \$1.85, and for the first half \$2.25; Connellsville Foundry, spot, \$2.10, and on contract \$2.25, at oven.

Finished Iron and Steel.—Dealers announce prices unchanged, with business dull. Mills are making very prompt deliveries. There are a few specifications in for building material of various kinds, Beams and Twisted Bars for concrete work being most active. Collections are slow. Most dealers attribute the present stagnation to the election excitement and do not expect any marked improvement until after November. Dealers' prices to the trade f.o.b. Cincinnati, are as follows: Iron Bars, carload lots, 1.65c., base, with half extras; small lots from store, 1.85c., base, half extras; Steel Plates, carload lots, 1.75c., base, with half extras; small lots from store, 1.85c., base, half extras; Base Angles, carload lots, 1.85c., base; small lots from store, 2.10c.; Beams, Channels and Structural Angles, 1.85c., base; small lots from store, 2.10c.; Plates, ¼-in. and heavier, carload lots, 1.85c.; small lots from store, 2c.; Blue Annealed Sheets, heavy, No. 16, carload lots, 2.15c.; small lots from store, 2.50c.; No. 14, carload lots, 2.05c.; small lots from store, 2.40c.; No. 10 and heavier, carload lots, 1.95c.; small lots from store, 2.20c.; No. 12, carload lots, 2c.; small lots from store, 2.30c.; Sheets (Light), Black, No. 28, carload lots, 2.65c.; Galvanized Sheets, No. 28, carload lots, 3.70c.; Steel Tire, 4-in. and heavier, carload lots, 1.95c.; Plates, 3-16 and No. 8, carload lots, 2c.; small lots from store, 2.20c.

Old Material.—There is no consumption, and dealers are turning their attention to each other, with prevailing prices a little weaker all through the list. The mills are apparently all stocked up, as nothing is being done in this direction. Some Old Car Wheels have been bought in this territory from Western dealers, at a considerable shading of the early September market, it is understood. Dealers' prices to the trade are about as follows, f.o.b. Cincinnati:

No. 1 R. Wrought, net ton	\$12.50 to \$13.50
Cast Borings, net ton	5.00 to 5.50
Heavy Melting Steel Scrap, gross ton	14.00 to 15.00
Steel Turnings, net ton	6.00 to 7.00
No. 1 Cast Scrap, net ton	12.00 to 13.00
Burnt Cast, net ton	9.00 to 10.00
Old Iron Axles, net ton	16.50 to 17.50
Old Iron Rails, gross ton	15.00 to 16.00
Old Steel Railing, short, gross ton	13.00 to 14.00
Old Steel Rails, long, gross ton	12.50 to 13.50
Relaying Rails, 56 lb. and up, gross ton	20.50 to 21.50
Old Car Wheels, gross ton	13.00 to 14.00
Low Phosphorus Scrap, gross ton	14.00 to 15.00

Cleveland.

CLEVELAND, OHIO. September 22, 1908.

Iron Ore.—While a few sales of small lots were made during the week, there was less activity in the market than in the previous two weeks. Some small inquiries are pending, but the merchant firms do not look for the sale of any large tonnages, as nearly all the consumers that will need more Ore have covered for their requirements. Ore is moving down the lakes at about the same rate as in August, and the shipments this month are expected to be between 4,500,000 and 5,000,000 tons, but a falling off in the movement is expected next month, and it is believed that the shipments will be very light after October. Prices at Lake Erie docks, per gross ton, are as follows: Old Range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; Old Range Non-Bessemer, \$3.70; Mesaba Non-Bessemer, \$3.50.

Pig Iron.—The market has been fairly active, being stimulated to some extent by the low prices that are prevailing. Sales have been mostly small lots of Foundry Iron, ranging from 100 to 500 tons for delivery over the balance of the year. The greater part of the buying has been by consumers outside of this territory. There is more inquiry for Foundry Iron for first quarter and first half delivery. While a large share of the inquiries are regarded simply as feelers, a little tonnage is being bought for next year's delivery. Some furnace interests do not care to sell for delivery so far ahead, but others are glad to take on such business. Furnaces are asking \$15 for No. 2 Foundry, for first half delivery, but this price is being shaded. The largest sale reported was made to a local foundry, the purchaser taking 1800 tons of Foundry Iron for the first half at a price under \$15, at furnace, for No. 2. Foundries are disposed to cover for a portion of their first half requirements, provided that they can buy at about present prices. The nominal Valley price for No. 2 Foundry for the balance of the year is \$14.50, but this is being shaded, and other Ohio furnaces seeking business have been forced to quote prices slightly lower than they have been holding to meet the competition. Valley furnaces are active in Indiana and Michigan, and are taking orders in competition with the nearby furnaces by quoting prices under \$14.50, at furnace. A number of inquiries are pending for the balance of the year delivery, including one for 1000 tons. We note the sale of 1000 tons of Malleable Bessemer for balance of the year. No sales of Basic Iron are reported, but inquiries have come out for 2000 tons of Basic for delivery in the Buffalo territory and 5000 in the St. Louis territory. For prompt shipment and for the balance of the year we quote, delivered, Cleveland, as follows:

Bessemer	\$15.90 to \$16.40
Northern Foundry, No. 1	15.50 to 15.90
Northern Foundry, No. 2	15.25 to 15.50
Northern Foundry, No. 3	14.90 to 15.25
Southern Foundry, No. 2	16.85 to 17.35
Gray Forge	14.40 to 14.65

Coke.—The market is still quiet and prices are about stationary. The Struthers Coal & Coke Company will start up about 125 of its ovens in a day or two. We quote Standard Connellsburg Furnace Coke at \$1.50 to \$1.55, at oven, for spot shipment, and \$1.65 to \$1.75 for the balance of the year. The only sales of Foundry Coke reported are small lots for spot shipment. We quote Connellsburg 72-hr. Foundry Coke at \$2 to \$2.25, at oven, for spot shipment and on contract.

Finished Iron and Steel.—Specifications on contracts have kept up fairly well, but the total placed was not so large as in the preceding week. Not much is developing in new business. The demand for Steel Bars continues very good, being far ahead of other lines in the volume of specifications, although the demand for Structural Material continues fair. Good Bar orders have come from the Rivet, Bolt, and Nut makers. A local Rivet maker has received orders for some Government work in Eastern shipyards, and this has helped out the Steel Bar specifications. The same concern is now figuring on some Government work in Panama. Specifications for Structural Material have come largely from small bridge companies that do county and municipal work. These plants are fairly busy, but bridge plants that devote their attention mostly to railroad work have little on hand. There is some demand for Structural Material for small buildings, but no building operation is being developed in this territory that will require a large tonnage of Structural Material. The demand for Iron Bars is still light, but it shows, possibly, a slight improvement. Railroads are doing some buying for repair work, but only in small lots. The demand for Plates continues light, orders being mostly for car lots and less. Additional specifications for 1500 tons of Plates for the new boats being built for the Pittsburgh Steamship Company have come from the American Shipbuilding Company. The price of Plates is being shaded from \$1 to \$2 a ton by some of the smaller mills. Eastern Bar Iron mills that have come in competition in this territory during the past few weeks are said to be quoting slightly higher prices, so that they are no longer a factor in the local field, although they are still quoting prices lower than the regular price. The demand for Sheets

is light, and small mills are shading prices \$1 to \$2 per ton. There is some demand for Light Rails in one and two car lots. Warehouse business holds up well, and jobbers report an improvement in mill orders. Mills received some good sized stock orders from jobbers during the week. We quote: Iron Bars, 1.45c., Cleveland, for car lots; Steel Bars, 1.50c., Cleveland, for car lots, half extras; Beams and Channels, 1.70c., base, Cleveland, and Plates $\frac{1}{4}$ in. and heavier, 1.70c., Cleveland. We quote Sheets, mill shipments, car lots, Cleveland, as follows: Blue Annealed, No. 10, 1.90c.; Box Annealed, No. 28, 2.60c.; Galvanized, No. 28, 3.65c. Jobbers quote Iron and Steel Bars out of stock at 1.65c. to 1.70c. Beams and Channels from warehouse are 2c., and Plates, $\frac{1}{4}$ in. and heavier, 1.90c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.10c.; Box Annealed, No. 28, 2.70c.; Galvanized, No. 28, 3.80c. Warehouse prices on Boiler Tubes, $2\frac{1}{4}$ to 5 in., are 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 71 per cent. discount.

Cast Iron Pipe.—The Board of Public Service of Cleveland received bids September 21 for 3000 tons of Cast Iron Pipe for the water works department and 220 tons of special and miscellaneous castings. The United States Cast Iron Pipe & Foundry Company named the lowest price, that company's bid for the Pipe, 3 to 36 in., inclusive, being \$69,300, or \$23.10 per ton, delivered on the streets. The estimated cost of hauling is 60 cents per ton, making the price, f.o.b. Cleveland, \$22.50 per ton. The city bought 3400 tons of Cast Iron Pipe of the same company on bids received June 29 at \$22.75 per ton, delivered on the streets, or 35 cents per ton lower than the present price. The low bid of the same company for special castings was \$35.70 per ton for 3 to 12 in., inclusive, and \$66.15 per ton for 16 to 30 in., inclusive.

Old Material.—The market shows no improvement. In fact, it has been quieter the past week than in the few preceding weeks. No good inquiries appeared, and the only sales to consumers have been a few small lots for immediate needs. Some buying in limited quantities was done by dealers. A sharp advance is noted in Iron and Steel Car Axles. The higher price is attributed to the scarcity due to the fact that few have been sold recently by the railroads. In other respects prices remain stationary, with little evidence of further weakness in spite of the dullness. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails	\$14.00 to \$14.50
Old Iron Rails	17.00 to 17.50
Steel Car Axles	19.00 to 19.50
Old Car Wheels	15.00 to 15.50
Heavy Melting Steel	13.50 to 14.00
Relaying Rails, 50 lb. and over	22.00 to 23.00
Railroad Malleable	13.25 to 13.75
Agricultural Malleable	12.00 to 12.50
Light Bundled Sheet Scrap	9.50 to 10.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles	\$20.00 to \$20.50
Cast Borings	7.00 to 7.50
Iron and Steel Turnings and Drillings	8.00 to 8.50
Steel Axle Turnings	8.50 to 9.00
No. 1 Busheaving	12.00 to 12.50
No. 1 Railroad Wrought	18.50 to 14.00
No. 1 Cast	12.00 to 13.00
Stove Plate	10.00 to 10.50
Bundled Tin Scrap	8.00 to 9.00

Birmingham.

BIRMINGHAM, ALA., September 21, 1908.

Pig Iron.—The most significant transaction recorded in the market the past week involved 1000 tons of Foundry grades for delivery covering the first quarter of 1909. With this exception, comparatively small quantities for prompt shipment and for delivery over the last quarter of this year composed the business transacted, although an aggregate of some 10,000 tons is reported having been engaged. The lowest price reached by recent negotiations is believed to be \$12.75, Birmingham, for No. 2 Foundry. Such a figure was the consideration on an aggregate of 4000 tons for the last quarter. For strictly first quarter delivery, \$13, Birmingham, for No. 2 is no doubt the lowest price that has been named. The prohibitive quotations on 1909 deliveries formerly adhered to by leading interests have been withdrawn in practically all cases, but sellers are disposed to be conservative as to commitments, and the \$13 schedule would apply probably to the first quarter only. There has been no appreciable improvement in the demand for any delivery. But few inquiries are reported pending and, judging by recent engagements, only a small proportion of the tonnage submitted will be purchased. As a matter of fact, the attitude of awaiting developments is more pronounced with melters, and there is considerable speculation as to the level at which the price will have been established at the beginning of the new year. The fact that a significant tonnage for delivery, commencing with the first quarter, was secured by merchant interests at much lower figures than are now being asked should not be overlooked. So far as can be ascer-

tained, there has been no resale of Iron by founders in this territory. A number of cases are known to exist where requirements for an unusually long period in advance were provided for at low figures reached some months ago, but in few instances have requests that shipments be deferred come from such sources.

Cast Iron Pipe.—For the tonnage offered the past week the recent advance in quotations has been maintained. The aggregate of engagements is attractive, but comparatively small lots have been the only considerations. The outlook for the winter months and early spring is considered good, both as to prices and volume of business. There is practically no accumulation of staple sizes, and the output of plants in operation is about normal. It is understood that resumption of operations at the only plant now idle, which was to have occurred September 15, has been postponed until a later date. In the absence of evidence to the contrary, prices are firm, and we quote as follows, for Water Pipe, per net ton, f.o.b. cars here: 4 to 6 in., \$24; 8 to 12 in., \$23; over 12 in., average \$22, with \$1 per ton extra for Gas Pipe. On large contracts these prices are probably shaded.

Old Material.—There is a fairly good demand for Wrought and Steel Scrap, and quotations have been maintained. But very little Steel has been involved in recent transactions, although the number of inquiries received is indicative of a material increase in activity at the mills. Car Wheels have been but slightly in demand, with similar reports as to Iron Rails and Iron and Steel Axles. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old Iron Rails.....	\$14.50 to \$15.00
Old Iron Axles.....	15.50 to 16.00
Old Steel Axles.....	13.00 to 13.50
No. 1 Railroad Wrought.....	13.50 to 14.00
No. 2 Railroad Wrought.....	10.50 to 11.00
No. 1 Country Wrought.....	11.00 to 11.50
No. 2 Country Wrought.....	9.50 to 10.00
No. 1 Machinery.....	11.00 to 11.50
No. 1 Steel.....	9.50 to 10.00
Stove Plate and Light Cast.....	9.50 to 10.00
Cast Borings.....	5.00 to 5.50

Buffalo.

BUFFALO, N. Y., September 22, 1908.

Pig Iron.—An atmosphere of quiet continues to envelop the market, with only a fair amount of inquiry. Some new business is being closed in quantities ranging from carloads to 1000 ton lots. A number of the furnace companies are increasing their outputs to some extent, the natural result being somewhat keener competition for orders. The following prices f.o.b. Buffalo, fairly approximate the current market:

No. 1 X Foundry.....	\$15.50 to \$16.00
No. 2 X Foundry.....	15.00 to 15.50
No. 2 Plain.....	14.75 to 15.25
No. 3 Foundry and Gray Forge.....	14.50 to 14.75
Malleable Bessemer.....	16.00 to 17.00
Charcoal	20.00 to 20.50

Finished Iron and Steel.—Considerable tonnage in Structural Material is being figured on in small lots, but only a limited number of new orders, principally small quantities, are now coming in. One of the estimates recently furnished covers the Structural Steel for a large addition to the plant of the International Acheson Graphite Company at Niagara Falls, upon which construction will soon be commenced. Another is for a large storehouse for the Niagara Electro-Chemical Company, Niagara Falls. The American Bridge Company has closed for the 1050-ft. viaduct to be erected over Chautauqua Creek at Westfield, N. Y., by the Buffalo & Lake Erie Traction Company, requiring about 1100 tons. Orders for Bars, Plates and railroad material keep up to a pretty fair volume in the aggregate, but continue to be in small lots principally, and for immediate shipment. New contracts are closed more freely than during the past two or three months, but only present needs are being specified against them.

Old Material.—The market remains quiet, with but little buying. Dealers are endeavoring to keep prices up, but consumers are not willing to purchase in any considerable quantity unless some concession is made. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy Melting Steel Scrap.....	\$14.00 to \$14.50
No. 1 Railroad Wrought.....	15.00 to 15.50
No. 1 Railroad and Machinery Cast Scrap	14.25 to 14.75
Old Steel Axles.....	17.00 to 17.50
Old Iron Axles.....	20.00 to 20.50
Old Car Wheels.....	15.00 to 15.50
Railroad Malleable.....	13.00 to 13.50
Boiler Plate.....	12.00 to 12.50
Stove Plate.....	12.50 to 13.00
Locomotive Grate Bars.....	11.50 to 12.00
Pipe	11.50 to 12.00
Wrought Iron and Soft Steel Turnings.....	8.00 to 8.50
Clean Cast Iron Borings.....	6.75 to 7.25
No. 1 Busheling Scrap.....	12.50 to 13.00

New York.

NEW YORK, September 23, 1908.

Pig Iron.—Reports from New England indicate a rather quiet state of affairs. In the territory west of the Hudson River there has been quite general buying, and a considerable quantity of Iron has been placed. There is now under negotiation one lot of 4500 tons. In Basic there has been a sale of 10,000 tons to one interest. We quote, at tidewater, Northern No. 1 Foundry, \$17.25 to \$17.75; No. 2 Foundry, \$16.75 to \$17.25, and No. 2 Plain, \$15.75 to \$16.25. Alabama Irons are quoted \$17.50 to \$17.75 for No. 1 Foundry and \$16.75 to \$17.25 for No. 2 Foundry.

Steel Rails.—The business actually reported closed in the week is between 5000 and 6000 tons, including one order for 2500 tons and one for 2000 tons. Inquiries for 28,000 tons for Western roads are pending. The Long Island Railroad is in the market for 900 tons. The Pennsylvania Railroad, which has placed no Rail order for 1908, still has a fair sized surplus of new Rails on hand—an example of its forehanded policy in the ordering of equipment and of material for maintenance of way.

Structural Material.—But for the remarkable pace set last year the current business in Steel buildings and bridges would be thought to represent a fair degree of prosperity. Prospective contracts still figure largely in the resume of the Structural situation, but while the slowness with which some projects mature is trying, it is noticed that few are spoken of as definitely laid aside. The Hackensack River bridge, to be built by the Pennsylvania Railroad, goes to the Pennsylvania Steel Company. For the highway bridge over the Hackensack which Hudson County is to build the general contract has been given to the F. M. Stillman Company, a Jersey City contractor, and the Steel will probably be furnished by the American Bridge Company. A local contract just let is for 1600 tons of Steel for the Martinique Hotel extension, at Broadway and Thirty-second street. The Emigrant Savings Bank, 5000 tons, and the Hoyt apartment building, at Broadway and Eighty-sixth street, will probably be let soon, C. T. Wills having the general contract for the former and the George A. Fuller Company that for the latter. Bids have just been asked for on the Steel for the Hoyt Building. The New York Central is in the market for a number of highway bridges, but its large work at the Grand Central Station is making little call on the Steel mills. The Pennsylvania Railroad is asking bids on a three-span bridge over the Susquehanna River—about 800 tons. At San Francisco the Mangin and Pacific Realty buildings have been placed—about 1000 tons together—the former going to Dyer Brothers, local contractors, and the latter to the Milliken Brothers' receivers. Bethlehem shapes will be used for both. The extensive building programme which Samuel Newhouse has on foot for Salt Lake City was halted last fall. About 4000 tons of Steel was delivered. If all the buildings are erected as planned, about 30,000 tons of Steel will be needed. The Structural mills are running about 55 per cent. of capacity, generally single turn. For tidewater delivery, mill shipments, we quote as follows: Beams, Channels, Angles and Zees, 1.76c.; Tees, 1.81c. On Beams, 18 to 24 in., and Angles, over 6 in., the extra is 0.10c. From store Structural Material, cut to lengths, is sold at about 2 1/4c.

Ferroalloys.—Considerable manipulation is evident in the Ferromanganese market. Large lots are quoted at higher prices than small quantities. Consumers can obtain 80 per cent. Ferromanganese at about \$44, Pittsburgh. Ferrosilicon is dull, and the demand is light; for 50 per cent. \$68 to \$70 can be done, delivered.

Bars.—Orders for Bar Iron have diminished both in number and size, although reports from the leading mills indicate that they are able to continue running up to their recent moderate degree of activity. Quotations on Bar Iron range from 1.45c. to 1.50c., tidewater, while Steel Bars continue to be held at 1.56c., tidewater.

Plates.—An eastern Pennsylvania mill has received an order for 400 tons of Steel Plates for a new Hudson River steamboat, to be built at Newburgh. While some improvement is noted in the general inquiry, the daily volume of business is of small proportions. Prices are held as follows, at tidewater, for standard sized Plates: Sheared Plates, 1.76c. to 1.86c.; Flange Plates, 1.86c. to 1.96c.; Marine Plates, 2.16c. to 2.26c.; Firebox Plates, 2.65c. to 3.50c., according to specifications.

Cast Iron Pipe.—The city of Reading, Pa., opened bids on Tuesday for about 500 tons. The Board of Trustees of the village of Alleghany, Cattaraugus County, N. Y., is advertising for bids to be opened September 29, for about 4 miles of 4 to 10 in. Pipe, 55 hydrants, 40 gate valves, &c. The city of Passaic, N. J., is advertising for proposals to be opened October 30 for distributing and laying about 37 miles of 6 to 20 in. Pipes, with hydrants, gate valves, &c. Some inquiry is noted for prices on deliveries next spring, but manufacturers hesitate to name figures so far in the future, in view of the uncertainties at present existing. The demand

for small lots has dwindled to almost nothing. Carload lots of 6 in. Pipe are quoted at \$24 to \$24.50, tidewater.

Old Material.—The current demand is reasonably fair, and prices are well maintained. Cast Scrap is strong, as the supply is quite small. Wrought Pipe is in good demand, and quite scarce. The accumulation of rolling mill stock is small, and with a slight improvement in consumption higher prices could be expected. We quote as follows, per gross ton, New York and vicinity:

Old Girder and T Rails for melting.....	\$11.50 to \$12.00
Heavy Melting Steel Scrap.....	11.50 to 12.00
Old Steel Rails, rerolling lengths.....	14.00 to 14.50
Relaying Rails.....	22.50 to 23.00
Old Iron Rails.....	16.50 to 17.00
Standard Hammered Iron Car Axles.....	18.50 to 19.00
Old Steel Car Axles.....	15.50 to 16.00
No. 1 Railroad Wrought.....	15.00 to 16.00
Iron Track Scrap.....	12.00 to 13.00
No. 1 Yard Wrought, long.....	14.00 to 14.50
No. 1 Yard Wrought, short.....	12.50 to 13.50
Light Iron.....	7.00 to 7.50
Cast Borings.....	7.50 to 8.00
Wrought Turnings.....	8.50 to 9.00
Wrought Pipe.....	11.00 to 11.50
Old Car Wheels.....	14.50 to 15.00
No. 1 Heavy Cast, broken up.....	13.50 to 14.00
Stove Plate.....	11.50 to 12.00
Locomotive Grate Bars.....	11.50 to 12.00
Malleable Cast.....	12.50 to 13.00

Metal Market.

NEW YORK, September 23, 1908.

Pig Tin.—Prices are slightly higher than last week, but the volume of business transacted has been small, with the exception of Monday, when sales were about 200 tons. The leading consuming interest in this country, which has been steadily selling for some weeks, has apparently marketed its line. This, with the elimination of Tin held here in a semi-speculative way by dealers, will give London operators a chance to sell again in this market. The price in New York may shortly be expected to go above London parity. Stocks of metal held here for London account are large and the end of the month will probably see further additions. It is felt that deliveries into consumption this month will not exceed 2500 tons, and as the arrivals have been 1967 tons and there are afloat for American ports 1320 tons, this seems reasonable. The auction sale of Banca Tin in Holland tomorrow (Thursday) will consist of 1800 tons, and this will increase the world's visible supply, which is already at a high figure. Price changes during the week have been as follows:

	Cents.
September 16.....	28.55 to 28.65
September 17.....	28.60
September 18.....	28.50
September 21.....	28.60 to 28.65
September 22.....	28.75
September 23.....	28.70

On September 21—the big day of the week—the bulk of the metal was sold at the inside price. The London market closes to-day at £130 10s. for spot and £132 for futures.

Copper.—Prices are lower, especially so for Electrolytic. Business is at a standstill, as buyers—and there are many who would buy if they considered prices right—are waiting for some large sale to clear the situation. Sellers are unwilling to force the market, which is in such a state of nervous tension that a small lot might break the price. Under such circumstances it is almost impossible to quote prices; Electrolytic, however, can be easily had at 13.37½c. for domestic consumption, while exporters will not pay 13.12½c. Lake is much out of line, as there are no stocks in second hands, and producers will not cut their price. It is probable that a buyer desirous of having high grade Lake promptly would have to pay 13.75c., but in comparison with Electrolytic 13.50c. would not be unreasonable. While the whole situation looks very gloomy, it can be affirmed on good ground that the market will only have to recede a little more until Europe will buy in good volume. That the lowest prices of the present decline have been reached is the opinion of more than one observer. The domestic consumption is far from what could be desired, but it is better than at any time during the first half of this year. To-day the London market shows signs of getting over its fright, and after heavy trading closed firm at £59 11s. 6d. for spot and £60 8s. 9d. for futures.

Lead.—While the market in some quarters is easier and certain brands are obtained at 4.50c., New York, the leading interest's price is unchanged, at 4.60c. Trade is exceedingly dull, especially so since Monday. In St. Louis the market is weak and Lead can be had at 4.35c.

Spelter.—While the market continues dull, with practically no business or inquiry, prices are steady. In New York prime Western brands are quoted at 4.75c., and in St. Louis the market is firm at 4.60c. to 4.65c. Production is falling off and now is probably less than the consumption.

Antimony.—Business is unusually quiet, but prices are

steady. Hallett's can be had at 7.75c. to 8c., Cookson's at 8c. to 8.25c. and outside brands at 7.50c. to 7.75c.

Tin Plate.—Business is quiet, so the enforced curtailment of operations at the mills through low water is not very serious. Prices are without change, at \$3.89, New York, and \$3.70, Pittsburgh, for 100-lb. I. C. Coke Plates.

Old Metals.—Prices are without change from a week ago, but it is so exceedingly dull that possibly some business might be done under the following dealers' selling prices:

	Cents.
Copper, Heavy and Crucible.....	12.50 to 12.75
Copper, Heavy and Wire.....	12.25 to 12.50
Copper, Light and Bottoms.....	11.50 to 11.75
Brass, Heavy.....	9.25 to 9.50
Brass, Light.....	7.25 to 7.50
Heavy Machine Compositions.....	11.75 to 12.00
Clean Brass Turnings.....	8.25 to 8.50
Composition Turnings.....	9.50 to 9.75
Lead, Heavy.....	4.20 to 4.25
Lead, Tea.....	3.85 to 3.90
Zinc, Scrap.....	3.25 to 3.50

Iron and Industrial Stocks.

NEW YORK, September 23, 1908.

The stock market has been under the influence of the first election scare. Anxiety as to the outcome of the approaching Presidential election has increased, and apprehension appeared to have reached an acute stage on Tuesday, when almost a demoralized state of affairs was experienced on the New York Stock Exchange. The following is the range of prices on active iron and steel stocks from Thursday of last week to Tuesday of this week, the low prices having been usually touched on Tuesday: United States Steel common 41½ to 46½, preferred 105½ to 109%; Bethlehem Steel common 18 to 21½, preferred 46½ to 49%; Can common 5½ to 5¾, preferred 58 to 60; Car & Foundry common 36 to 39, preferred 102½ to 102¾; Locomotive common 44 to 45½, preferred 100½, ex-dividend to 104; Steel Foundries, new, 28 to 30; Cambria Steel 34½ to 37½; Colorado Fuel 30¾ to 34¾; Crucible Steel common 5½ to 6¾, preferred 42½ to 47½; Pressed Steel common 28½ to 31½, preferred 93 to 94; Railway Spring common 34½ to 35½; Republic common 20½ to 22, preferred 75 to 79½; Sloss-Sheffield common 59 to 63; Cast Iron Pipe common 24½ to 24¾, preferred 71 to 72½. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 42½, preferred 107½, bonds 101; Car & Foundry common 37¾, preferred 102¾; Locomotive common 45½, preferred 101½; Colorado Fuel 32½; Pressed Steel common 30, preferred 94; Railway Spring common 34; Republic common 21½, preferred 77; Sloss-Sheffield common 59½; Cast Iron Pipe common 27½, preferred 71; Can common 5½, preferred 58.

The balance sheet of the Reading Iron Company, Reading, Pa., as of June 30, 1908, showed assets of \$14,542,876.06. The capital stock remained at \$1,000,000 and the outstanding mortgage bonds, after deducting the sinking fund securities deposited with the trustee, amounted to \$303,811.94. The current liabilities, with accrued interest and dividends, amounted to \$154,529.31.

Dividends.—The American Iron & Steel Mfg. Company has declared quarterly dividends of 1¼ per cent. on the common and preferred stocks, payable October 1.

The American Shipbuilding Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable October 16.

The Westinghouse Air Brake Company, Wilmerding, Pa., has declared a quarterly dividend of 2½ per cent., payable October 10.

The Union Switch & Signal Company, Pittsburgh, has declared a quarterly dividend of 2½ per cent. on the common and preferred stocks, payable October 10.

Manning, Maxwell & Moore, Inc., have declared a quarterly dividend of 1½ per cent., payable September 30.

The bi-monthly examination of sales sheets of the Republic Iron & Steel Company and the Union Rolling Mill Company for the 60-day period ending August 31, 1908, showed that the average price of iron bars shipped out in July and August necessitates a reduction in wages of puddlers and heaters for September and October to the basis of 1.30 cents on iron bars. Puddlers will be reduced to \$5.25 a ton and finishers about 2 per cent. The examination of the certified statements of the American Sheet & Tin Plate Company for the same 60-day period showed that the average price of 26, 27 and 28 gauges was 2.34 cents, hence the wages of sheet mill workers will remain the base rate of scale. The average price for 100-lb. coke plates was \$3.54; hence the wages of tin plate workers for September and October will be the base rates of scale.

The Basic Bessemer Process.

A splendid piece of research work on the basic Bessemer process has been completed by F. Wuest, of the technical school at Aix-la-Chapelle, and L. Lavel, the results having been published in *Metallurgie* Nos. 15 and 16. The object of the work was to bring up to date the earlier researches of Ehrenwerth, Mueller, Kupelwieser, Stead and Hilgenstock, which cover the period from 1879 to 1886; to study the different phases of the process for the first time from the point of metallography; to determine the heat balance and follow the course of the different substances.

The experimental work was done at the Dudelingen Works, where two heats were blown. All the materials were carefully weighed and analyzed, samples of the metal and cinder were taken at frequent intervals, and an effort was made to secure analyses of the gases from the converter. The moisture in the blast was carefully determined, and the temperature of the converter gases was followed. The heat balance thus worked out is interesting, tentative though it be. Thus, in one blow, 43 per cent. of the heat was furnished by the molten iron and 57 per cent. by the oxidation of the elements in the bath. Of the heat thus generated 24 per cent. was carried off by the gases and by the decomposition of moisture in the blast, 20 per cent. was used for heating the lime additions and was carried off by the cinder, 48 per cent. was carried off by the steel and 8 per cent. was lost by radiation.

An interesting computation from the data is that relating to the saving of phosphorus, when dry air is used for blowing. In the one blow it would amount to 12 per cent. and in the second to 15 per cent. Dr. Wuest has also done some figuring on the effect of enriching the blast with oxygen and on heating the blast.

The Waste of Iron in the Basic Bessemer Process.

The following points are made in the final summary of the detailed record of the experiments: The quantity of foreign substances in basic Bessemer pig varies between 6.7 to 7.8 per cent., but the waste in carrying through the process is considerably higher, because a good deal of iron is burnt. In the two trial heats the loss of metallic iron was 8.2 and 10.7 per cent., respectively. The greater part of the waste of iron occurs toward the end of the afterblow, because large quantities of iron must be sacrificed in order to eliminate phosphorus adequately from the bath. The quantity of iron required to eliminate the last 0.1 per cent. of phosphorus amounted in the two blows to 2.7 and 4.7 per cent. The quantities increase the hotter the blow is toward the close, since with increasing temperature the affinity of iron for oxygen increases more rapidly than that of phosphorus.

The study of the heat balance of the basic Bessemer process shows the fact, disadvantageous from the point of the waste of iron, that the largest increases of heat are brought about by the elimination of phosphorus. At this period of the process only phosphorus is present besides iron, and the result is that the considerable increase in the temperature of the bath is the cause of the burning of larger quantities of iron. This heat development is necessary to carry through the process and occurs at a time unfavorable to the economic side. It would be better, if this excess of heat took place, as it does in the acid Bessemer process, in the beginning of the blow, but this can never be attained by reason of the thermal and metallurgical action of the foreign substances participating in the reactions. Some help may be given by cooling the bath by additions of scrap, by the Flohr method of adding lime briquettes or by charging crude limestone, but these methods can never overcome this fundamental drawback of the basic Bessemer process.

The Field of the Basic Bessemer Process Will Be Narrowed.

Assuming that on an average 3 per cent. of the charge of iron is required to eliminate the last particles of phosphorus, it appears that 30,000 tons of iron go to waste in the slag in making 1,000,000 tons of basic Bessemer steel. It is obvious, therefore, that the field of the basic Bessemer process will be narrowed as soon as more

rational and economical methods of refining are available. The open hearth methods now being developed even today permit of a more economical conversion of pig iron into steel because in the ore process the foreign substances in the pig are consumed at the cast of the oxygen in the ore and corresponding quantities of iron are carried into the bath. The utilization of the high phosphorus contents in certain iron ores is as readily possible in the open hearth as in the converter as soon as progressive refining is adopted. In the first cinder 90 per cent. of the phosphorus may be concentrated and a product as valuable as the basic Bessemer slag may be obtained. The later finishing slag which takes the last impurities from the bath must be high in iron in order to effect the purification. This may be utilized in the blast furnace so that the waste of iron is not as large as it is in the basic Bessemer.

The use of dry, oxygenized or hot blast does not so modify the disadvantageous features of the basic Bessemer process as to assure a future under all circumstances. The use of dry blast has no great advantage from the standpoint of the heat balance, because there is no serious saving in heat, but the blowing of the charge with dry blast would undoubtedly exert an excellent influence upon the quality of the steel because then no opportunity is afforded to the liquid bath to absorb considerable quantities of hydrogen. Steel produced with the air of dry blast will certainly be notable for greater density and toughness.

Car Wheel Conferences.

The Wheel Committee of the Master Car Builders' Association is taking steps looking to the manufacture of better chilled cast iron car wheels. A letter has been addressed by the chairman of the committee to the car wheel manufacturers asking them to agree on a specification. Expressions for railroad representatives who have previously met the car wheel manufacturers in conferences indicate a disposition to specify a charcoal iron mixture. On behalf of the manufacturers it is continually urged that the first requisite to the improvement of the chilled car wheel is the payment by the railroads of a price which will permit the use of charcoal iron exclusively or charcoal iron and old wheels made from such iron. It is expected that the Master Car Builders' committee and the wheel manufacturers will hold a series of conferences in the near future in the hope of reaching a better understanding. The allusions in some of the recent newspaper articles to a "car wheel fight," similar to the "rail fight" of last year are not warranted by the amicable spirit in which the subject is being taken up by the railroads and the manufacturers.

The Committee on Standard Rail and Wheel Sections of the American Railway Association will meet next week to consider the wheel situation and determine what report it will make to the forthcoming semi-annual meeting of the association.

The Pittsburgh White Metal Company, Pittsburgh, with works in that city and also in New York, is manufacturing a grade of white metal for general purposes that has been successfully used for about 15 years, having won favor as an anti-friction metal. The metal is known as Armature, and is suitable for bearings for armatures, dynamos, engines and rolling mill, planing mill and flour mill machinery, or wherever high speed and heavy work are required.

Bolckow, Vaughan & Co., Middlesbrough, England, have secured an order for 26,000 tons of rails from the Indian State Railways. This follows closely on an order for 15,000 tons for Western Australia taken by the North-eastern Steel Company, Ltd., at a higher price than was named by Belgian mills.

The exports of iron ore from Spain in the first half of 1908 were but 3,917,076 tons, against 4,659,450 tons in the corresponding six months of last year.

OBITUARY.

JOHN LEONARD.

John Leonard, who for nearly 50 years was actively engaged in the iron trade in New York City, was accidentally shot and killed September 16, in his home at Montclair, N. J. The accident occurred in handling a pistol which had been shown him by Walter C. Phillips, his secretary.

Mr. Leonard was born in County Tyrone, Ireland, September 30, 1829. He came to this country in 1848, landing in Boston. His first position in New York City was as shipping clerk in a glass factory. He then entered the employment of Patrick Cassidy, a scrap iron merchant, who afterward was a member of the well-known firm of Cassidy & Adler, iron founders. Mr. Leonard was employed by Mr. Cassidy until 1856, when he embarked in business as a scrap iron merchant at 450 West street. Shortly afterward he became connected with the Powerville Iron Works, Boonton, N. J., operating a rolling mill. In 1881 he started the Manhattan Rolling Mill, at the corner of Bank and West streets, New York City. He was sole proprietor of this mill until 1899 when a corporation was formed to take it over, his associates being Michael Blake and Frank D. Cadmus. Mr. Leonard was elected president, Mr. Blake vice-president and Mr. Cadmus treasurer and general manager. In 1892 the mill was removed to Twenty-third street and Avenue A. Three years ago Mr. Leonard's interest in this corporation was purchased by Messrs. Blake and Cadmus, and since then Mr. Leonard has not been associated with it. The present officers are Michael Blake, president, and F. D. Cadmus, vice-president and treasurer.

In February, 1899, Mr. Leonard associated with Mr. Blake in forming the firm of John Leonard & Co., to conduct a scrap iron business, each owning a half interest. On February 1, 1903, Mr. Leonard retired from this firm. In fact, he had never taken an active part, the management from its inception being in the hands of Mr. Blake. The firm of John Leonard & Co. is now located in the Singer Building, 149 Broadway, and Michael Blake is the executive and financial head. Mr. Leonard was not in the scrap business at Twenty-third street and Avenue A as reported in the daily papers. After the Manhattan Rolling Mill was incorporated in 1899, Mr. Leonard retained a number of accounts outstanding among his local customers, and for the purpose of collecting these he employed Mr. Phillips, who has always been held in high regard by both Mr. Leonard and Mr. Blake. Mr. Phillips subsequently attended to all the personal matters of Mr. Leonard, acting in the capacity of private secretary. The deceased leaves a widow, two sons and two daughters. One son, Harry V., resides at Glen Ridge, N. J., and the other, Louis H., is employed by the Chesapeake Metal & Iron Company, Baltimore, a corporation principally owned by Michael Blake.

SAMUEL J. RITCHIE of Akron, Ohio, who pioneered in the development of the copper and nickel deposits of the Sudbury, Ont., district, died suddenly at Charleston, W. Va., September 19, aged about 75 years. He secured the building of the Central Ontario Railroad, leading to the Sudbury mines, and organized the Anglo-American Iron Company and the Canadian Copper Company. The two latter companies were involved in protracted litigation between Mr. Ritchie and Judge Stevenson Burke and the Estate of United States Senator Henry B. Payne, claims amounting to millions of dollars being at stake. Mr. Ritchie was an ardent advocate of reciprocity with Canada, and 25 years ago was a prominent figure at the Canadian capital.

DR. THEODOR PETERS, the director of the Verein deutscher Ingenieure, died September 2. Born November 15, 1841, at Menden, near Siegburg, Germany, where his father owned a forge, he became an engineer, and for a while was a partner of the firm of A. H. Oechelhaeser at Siegen. In 1882 he became manager of the society above named, and in 1891 succeeded Dr. Grashof as di-

rector. As editor he developed the *Zeitschrift des Vereins deutscher Ingenieure*, until it is now the foremost technical journal in Germany.

JOHN K. COOKE died at Paterson, N. J., September 16, aged 51 years. He was born at Scranton, Pa., and was for years superintendent of the Passaic Rolling Mill Company, founded by his father, the late Watts Cooke. He leaves a widow and three children.

HARRY O. EMORY, for many years secretary and general manager of the Tioga Steel & Iron Company, Philadelphia, Pa., died September 8 at his home in Merion, Pa., after a prolonged illness.

WALTER E. DEVLIN, president of the Philadelphia Hardware & Malleable Iron Company and of the Brohard Company, Philadelphia, Pa., died September 19 from complications resulting from an operation for appendicitis, aged 38 years. He was the second eldest son of Thomas Devlin, well known in the malleable iron and hardware trade, and has been associated with him in a number of enterprises. He leaves a widow.

WILLIAM GAMBLE, Miamisburg, Ohio, died September 15, aged 75 years. He was a native of Geneseo, N. Y., removing to Ohio when a young man. After an active experience in the dry goods business at Dayton, and in the wholesale book and stationery trade at Cincinnati, he removed to Miamisburg in 1871, becoming a partner in Hoover & Co., manufacturers of reapers and mowers. In 1892 the Hoover & Gamble Company was formed to manufacture twine making machines, of which he was made president. He was also president of the Bookwalter Wheel Company, and was a director of a number of financial institutions. He leaves a widow, one son, and one daughter.

PERSONAL.

Howard C. Noble, vice-president of the North & Judd Mfg. Company, New Britain, Conn., has returned from a European trip.

H. P. Gilbert, formerly general manager of the Sharon Steel Hoop Company, Sharon, Pa., on October 1 will take charge of the company's Chicago offices.

William J. Ogden has been elected secretary of the Tioga Steel & Iron Company, Philadelphia, Pa., succeeding H. O. Emory, deceased.

Elbert H. Gary, chairman of the United States Steel Corporation, returned from his European trip on Tuesday. He says he sees no reason to revise his belief in improving business conditions as expressed prior to his departure in July.

John W. Gates arrived in New York on Saturday from a brief sojourn abroad.

H. C. Karlson has opened an office at 39 Cortlandt street, New York, as solicitor of patents and constructor of special and automatic machinery.

C. G. Hussey & Co., operating the Pittsburgh Copper & Brass Rolling Mill, at 2850 Second avenue, Pittsburgh, manufacturing sheet copper and copper specialties, such as copper gaskets, nails, tacks, special shapes, both sheared and stamped, &c., has awarded a contract to the A. Garrison Foundry Company, Pittsburgh, for a 24 x 72 in. mill for rolling sheet copper. The firm also has in contemplation the erection of a two-story brick addition to its present plant, which will give it an increased capacity in its nail and stamping departments. Work on this building will be commenced shortly, and contracts have already been let for the required machinery.

The American Steel & Iron Company, Norwalk, Ohio, operating the works of the former Norwalk Steel & Iron Company, is accomplishing good results under the management of H. E. Frazier, who recently went to Norwalk from the offices of Rogers, Brown & Co., Cincinnati. The Western business of the company has been placed in the hands of W. E. Stockton, Chicago.

The Machinery Trade.

NEW YORK, September 23, 1908.

The improvement in business conditions has been so gradual as to have not yet noticeably affected the demand for machinery, which continues light and irregular. In lines closely connected with the machine tool interests confidence has apparently not been fully restored, for the large interests which are usually prominent factors in the market are displaying very little activity. Now and then a fair sized proposition comes up, but they are so scarce as to only cause a little encouragement. The past week was one of varied experiences with the different houses, some reporting sales equal to those of the previous week, while others report a falling off. Taken together, it is doubtful if the aggregate of business transacted excels that of the previous week. The railroads continue to give evidences of activity, but mostly in the way of new construction, work that will not materially benefit the machinery trade for some time to come. Some little buying, however, is being done, and in the West the Chicago, Milwaukee & St. Paul Railroad has issued a list covering 36 heavy machine tools.

Power equipment, especially the larger units, is little in demand, while the smaller apparatus is selling better. This is particularly true with manufacturers of electrical machinery, and is no doubt due to some extent to the number of municipal lighting plants being established by small towns. The present demand for electrical machinery clearly shows the falling off in the development of industrial enterprises. From a prominent interest we learn that the demand for electric lamps and such small apparatus as is not used for the generation of power is about normal, but it grows less for the machines as the size and cost increase until that for the large units is very light. For some of the small machines prices have been reduced, but as the cost of manufacture varies but little from that of the past year it is not likely that a reduction in prices on the entire line will be made. As in the machine tool trade, an occasional large order is placed. The General Electric Company has secured an order from the Commonwealth Electric Company, Chicago, Ill., for turbo-generators of large horsepower, aggregating about \$1,000,000 in value.

The demand for sugar making equipment has fallen off to some extent of late, as it usually does at this time of the year; but representatives of export houses that cater to that line state that they have had a fairly busy season, and in comparison to the average machinery line the sugar machinery equipment trade has been fairly brisk. There are still some straggling inquiries out for power equipment for plants in Cuba and Porto Rico, but the trade is devoting most of its energies to making deliveries on machinery ordered during the summer.

Foundries catering to the machinery trade report a better demand for steel castings, which is taken as an indication in some quarters that machinery manufacturers in general are taking faith in the future and are preparing to get equipment in order to have machinery on hand for any demand that might arise. Some machinery manufacturers who have not placed orders for castings in several weeks because of the fact that they had enough machinery on hand to meet the demand have been asking for prices, and from some quarters inquiries have come as to terms for long time contracts. This is encouraging to the founders because they have not succeeded in persuading many manufacturers into a yearly contract, as was the custom for the last three or four years, and the founders declare that they now see more work ahead than they did at any time during the last three months. A large number of inquiries at present before the steel foundry trade, however, call for special castings, rather than for castings to be used in the manufacture of standard machines.

During the past two weeks a noticeable increase in construction work has been reported by the railroads, especially in the way of new shops and terminal facilities. While most of these operations are individually small, they will necessitate the purchase of quite a large amount of new machinery. The Missouri, Kansas & Texas Railroad, whose chief engineer is located at St. Louis, Mo., is building a division terminal for freight trains at Wagoner, Okla., where shops and a roundhouse will be erected. While plans for these latter structures have not yet been completed, it is understood that the shops will be extensive. In this connection it is of interest to state that the Lake Shore & Michigan Southern Railroad is to build a large terminal yard at Miller, Ind., involving an expenditure of several hundred thousand dollars.

Some machinery has been purchased by the contractors on the construction work of the cut-off on the Delaware,

Lackawanna & Western Railroad line between Lake Hopatcong and the Delaware Water Gap, and there are inquiries now in the market for outdoor equipment for that work. As has been told in these columns, about 28½ miles of railroad is being built through a territory in which, there is some rather difficult engineering, as the work entails in some places considerable excavation and at other points a great amount of filling. This necessitates the use of numerous steam shovels and a large quantity of conveying equipment. Although the contractors on the work have large plants, they have found it necessary in some cases to make additions to their machinery outfit, with the result that they have inquiries in the market for immediate delivery as work on the sections is already under way. The contracting companies building the line are: Section 1, Timothy Burke, Scranton, Pa.; section 2, Waltz & Reece, Billings, Mont.; section 3, D. W. Flickwire, Terry Building, Roanoke, Va.; section 4, W. H. Gahagan, 189 Montague street, Brooklyn, N. Y.; section 5, Hyde-Macfarlane Company, 7 East Forty-second street, New York; section 6, Reiter, Curtiss & Hill, Arcade Building, Philadelphia, Pa.; section 7, Smith & McCormack, Easton, Pa.

Plans for the new terminal of the Public Service Corporation of New Jersey to be built at Hoboken have been completed, and it is expected that before long the trade will hear of considerable in the way of machinery requirements for the building. The structure will be built of steel and concrete and will have a width varying from 60 to 160 ft. and a length of 400 ft., and it will be two stories in height. Arrangements will be made to accommodate trolley tracks on both floors, and connection will be made with the Hoboken end of the McAdoo tunnel. The Public Service Corporation has offices in the Prudential Building on Broad street, Newark, N. J., and the buying of the machinery equipment will be done from there.

We understand that orders for some of the equipment for the new terminal of the Pennsylvania Railroad in New York have recently been placed by Westinghouse, Church, Kerr & Co., New York, under whose supervision the work is being done. This terminal will require the installation of a large amount of equipment, and it is likely that considerable more will be purchased as building operations progress.

Purchases of mechanical equipment have recently been made by the Rapid Transit Construction Company for the temporary shops it is establishing at Broadway and Ninety-seventh street, New York. These shops are to be used in connection with the enlargement of the Subways from Ninety-sixth street to 102d street and comprise six buildings, costing about \$60,000. The entire work will cost about \$800,000, including the construction plant.

The Erie Foundry Company, Erie, Pa., whose machine shop was recently destroyed by fire, has completed plans for its new machine and blacksmith shops and will shortly award contract for construction of buildings, bids for which were opened Monday. The machine shop proper will be 100 x 100 ft., of saw tooth construction on one side and monitor construction on the other, and will be served by a 15-ton crane with 47½ ft. span. The blacksmith shop will be about 25 x 62 ft., of lean-to construction, and will be built of steel and brick. The building has only a temporary end, as it is the intention to double its size in the near future. Very little new equipment will be required for this latter building, and most of that which will be needed has been purchased.

The LaMay Machine Works, Arthur C. LaMay, general manager, 48 North Water street, Rochester, N. Y., has purchased a site of 15 acres, extending 2000 ft. on Emerson street and 325 ft. on McNaughton street, on which will be erected an extensive plant for the manufacture of special machinery. The first group of buildings to be erected will consist of a main manufacturing building, one story, 180 x 200 ft.; brass foundry, one story, 30 x 50 ft., and a power house, 40 x 60 ft. As soon as the buildings can be finished construction will be started on a malleable iron foundry building. The plant will be of the most modern equipment throughout and a steam electric generating plant will be installed. The larger machines will be operated by individual motors, while some of the smaller machines will be grouped and operated from motor driven line shafts. The various machine tools, cranes, hoists, &c., will be electrically operated. Mr. LaMay states that when his plant is in full operation it will give employment to at least 1000 men.

The American Cement Engineering Company, a holding organization for the Knickerbocker Portland Cement Company, 315 Fifth avenue, New York, has purchased three pieces of property, with a total of over 500 acres, near Alsen, N. Y., and will soon start construction on a cement plant to have a capacity of 3000 bbl. daily and cost about \$1,000,000.

Catalogues Wanted.—The Morigrave Engineering Company, Perth Amboy, N. J., desires catalogues and price-lists of power plant equipment, specialties and supplies. R. Henderson is vice-president and consulting engineer.

H. S. Palmer, Beaver Falls, Pa., machinery dealer, desires catalogues of machinery and general mill, mine and factory supplies.

Chicago Machinery Market.

CHICAGO, ILL., September 22, 1908.

While there have been few if any individual transactions in machine tools of noteworthy interest in the past week, trade has, on the whole, been gaining rather than losing ground. The majority of the dealers report an increased volume of business, but in a few instances a contrary experience is noted. It is expected, however, that in the general distribution of the moderate volume of business represented in current orders there should be more or less inequality of division, but withal so long as accretions indicate improvement at large there is small room for discouragement. There have been rumors afloat during the past week or two of the revival of some of the large projects involving the construction of new plants and extensive equipment purchases which were prominently before the trade early last year and because of the depression following the late panic were held up. In one case, at least, it is known that such action is under advisement, and should a favorable decision be reached in the matter it would mean the reinstatement of a large list of tools to be figured on by the trade. There is nothing in recent developments, however, indicating that the railroads are ready to go ahead with improvements of like character which were under way and suspended for lack of money. The extensive list of tools required for the equipment of the new shops of the Frisco System at Springfield, Mo., is one of those that since its withdrawal last fall has been held in abeyance. Sooner or later this machinery will doubtless be purchased and an intimation of early action in this direction would be hailed as a most encouraging sign, but there is no talk of such action at present. Aside from scattered inquiries from the railroads for occasional tools, the principal requirements in this line being figured on is comprised in a new list just issued by the Chicago, Milwaukee & St. Paul for the equipment of its Deer Lodge shops on the new coast extension in Idaho. The list includes 36 large tools and constitutes an important addition to former purchases made this year on account of the new line.

Large undertakings in new plant construction are comparatively rare at present, but here and there announcement of such work of more than usual importance gives evidence of confidence in the outcome of the future. A project of this kind is embraced in the construction of a new stone crushing plant to be erected by the Dolese & Shepard Company at Gary, Ill., which is located on the Drainage Canal and the Santa Fé Railroad, about midway between Chicago and Joliet. Owing to the confusion arising from the similarity of names since the organization of the town of Gary, Ind., the site of the steel works of the United States Steel Corporation, it is likely that the name of the Illinois town will be changed before long. The new stone crushers in question will take the place of the company's former plant at this location, which was destroyed by fire some time ago, but will far exceed the old works in magnitude. It is, in fact, designed for a capacity three times as great as the plant which it will replace, and it is said will be the largest installation for crushing, handling and storing stone ever made in this country. Something of the extent of the work contemplated can be gathered from the fact that 2200 tons of structural material will be used in the various buildings, trestles and hoisting towers provided for in the plans. These include a screen house, 28 storage bins, rolling house, crusher houses, conveyor trestles, machine repair shop, &c., which will cover an area of about 100 x 700 ft. Plans for these structures are now practically finished and preparations are being made for the placing of contracts. It is expected that they will all be under roof by the first of the year; some of the heavier machinery will be installed during the process of construction. The machinery will be electrically driven by current furnished from the Lockport generating station of the Drainage Canal. A large amount of equipment will be required to complete this installation.

The Industrial Power Company of Milwaukee, Wis., manufacturer of Atkinson automatic gas producers, has been sold to a recently organized Wisconsin corporation called the Industrial Gas Power Company, with offices at 621-622 Caswell Block. The officers of the new company are W. O. Jones, president and treasurer; C. J. Atkinson, vice-president; H. K. Cowen, assistant treasurer and secretary. Mr. Jones was for a number of years vice-president and purchasing agent of the Planor Mfg. Company. Both Messrs. Atkinson and Cowen have been connected with the Industrial Power Company since its organization. The Industrial Gas Power Company will continue to manufacture the Atkinson gas producers, of which there are a large number in successful operation at the present time.

The Galena Iron Works Company, Galena, Ill., which has completed the erection of a new concentrating plant for the Kennedy Mining Company with a mill of 100 tons capacity, has just secured a contract from the United States Zinc Corporation for the installation of a roaster and sepa-

rating plant of 60 tons daily capacity, for the treatment of zinc ores on property adjoining the Kennedy mine.

Plans are being made by the Seguin Electric Light & Power Company, Seguin, Texas, to rebuild its water plant, and in the course of this improvement the company will probably install new water wheels.

The Pleasant Shades Power Company, Crawfordsville, Ind., has been organized and incorporated, with a capital stock of \$100,000, for the combined purpose of developing a hydro-electric plant and the establishment in connection therewith of a pleasure and health resort. The building of a dam 20 ft. in height across Sugar Creek and the erection and equipment of a power house supplied with turbines and generators are included in the plans, which also contemplate the construction of other buildings.

The United States Indian Industrial School, Phoenix, Ariz., C. W. Goodman, superintendent, is advertising for bids, which will be received until September 30, on power equipment, which will include two 125-hp. boilers, on which alternative bids for standard water tubular and Scotch marine boilers with corrugated flue furnaces will be considered; boilers to be set up complete in place, with an extra set of flues and grates. The boilers are to be fully equipped for burning oil. There will also be required two oil pumps, one feed water heater of 400 hp. capacity; one duplex steam pump; one steam separator; and a 15 hp., 208 volt 60-cycle single phase alternating current motor.

Cleveland Machinery Market.

CLEVELAND, OHIO, September 22, 1908.

The most encouraging new feature of the local machine tool market is the fact that some of the dealers and builders report an improvement in the demand from large manufacturing establishments, the majority of which have bought practically no tools during the greater part of the year. Taken altogether, however, sales are fewer than a month ago, owing to the fact that the automobile people are about through buying new equipment for the coming season and sufficient business has not developed from other sources to keep up the August volume of sales. The political campaign is beginning to be felt considerably, and the managers of some plants who have the installation of new machinery under consideration have decided to purchase no new equipment until the result of the election is known.

No good sized inquiries are pending, and sales continue to be limited to single tools and lots of two or three. While more activity is being shown in the erection of additions to existing industrial plants, very few of these projects are in lines that use machine tools. This work, however, has caused an increase in the demand for small electrical equipment and some classes of special machinery. There are scarcely any new companies being formed in this territory for the manufacture of metal products and consequently the demand from new concerns for machine tools is very light.

Some of the tool builders report a slight improvement in orders, as a result of which their plants are being operated at a larger capacity than a month ago, but with others conditions remain about the same. Railroad inquiries are about as scarce as ever, both for machine tools and for locomotive cranes and other handling machinery, and the demand for locomotive cranes is still very light. The foreign demand for machine tools shows no improvement. In special machinery there is a fair demand for dryers, and the demand for cement making machinery, which has been very light for several months, shows some improvement.

The demand for second-hand machinery, which has been fairly good for some time, is somewhat lighter.

Some improvement is noticed in the demand for steel castings, but a great deal of price cutting is going on. A slight improvement continues to be noticed in the demand for iron castings.

The Wellman-Seaver-Morgan Company has secured the contract from the Navy Department for building a 100-ton floating crane for the Bremerton Navy Yard, the contract price being \$230,000. This with another large contract recently received by the company to build an ore handling plant for the Pittsburgh & Conneaut Dock Company at Ashtabula, together with other smaller work on hand, will keep the company's plant busy for several months.

The National Acme Mfg. Company reports a slow but steady improvement in orders for its line of machine tools, and the working force in its plant is being increased from week to week. The company has recently received some fairly good orders from large concerns that had been out of the market for some months.

The Empire Iron & Steel Company and the Sheet Metal Mfg. Company, Niles, Ohio, report an improvement in the demand for sheets and their mills are running on full time.

The rubber industry in Akron is in a prosperous condition and some of the large manufacturers of rubber products are planning to make extensive additions to their plants. The Osborn Engineering Company, Cleveland, has prepared

plans for a large factory building to be erected by the Goodrich Tire & Rubber Company. It will be 60 x 200 ft. and five stories high. The building will be of steel, with mill floors. Bids will be received soon. The same engineering firm is preparing plans for a large fireproof building to be erected by the B. F. Goodrich Company. The company expects to erect other buildings after this one is completed.

The C. O. Bartlett & Snow Company has secured a contract for a slag crushing plant to be installed at the new Cuyahoga plant of the American Steel & Wire Company. The company reports an improvement in the demand for dryers and cement machinery, and is now running its plant 12 hr. a day in nearly all departments.

C. E. F. Ahlm, engineer, Caxton Building, Cleveland, has the contract for erecting a power station for a municipal lighting plant at Lima, Ohio, and is preparing the plans.

The Mansfield Railway Light & Power Company, Mansfield, Ohio, will purchase a 1000-kw. turbine and 500-hp. boilers, to double the capacity of its plant.

The Akron Iron & Wire Company, Akron, Ohio, has been incorporated, with a capitalization of \$15,000, by S. D. Kenfield, W. F. Koerschner, J. W. Mueller, J. M. Davidson and F. R. Moore.

The Colonial Fan & Motor Company, Warren, Ohio, has been incorporated, with a capitalization of \$10,000, by J. B. Estabrook, E. E. Nash, Robert W. Bean, F. E. Watts and D. R. Estabrook.

Cincinnati Machinery Market.

CINCINNATI, OHIO, September 22, 1908.

In practically all machinery lines save the heavy specialty and tool building there is to be noted a little improvement over a week ago, and a few of the tool builders may with justice come under this classification; but, speaking collectively, the machine tool trade has not cause to feel that permanent improvement has set in.

The inquiries are a little heavier and the impression seems to obtain that the railroads have begun to take a little interest, buying here and there some needed tools, but still avoiding the customary list of specifications with which tool builders have been provided in times past. For some time foreign inquiry has been very light, and even those concerns which have for years catered to this trade and understand its requirements and its eccentricities are complaining of the indifference and apparent inertia of the European manufacturer. During the week some machinery has been sold from this market for shipment to Paris, Rotterdam and some South American ports. The Government is also buying some needed tools and machines for battleships. The Steptoe Shaper Company sold during the week a 16-in. motor drive shaper for installation in the toolroom of the battleship Delaware. The Lodge & Shipley Company is at work on a big lathe for the Portsmouth Navy Yard, 48-in. swing with a 56-ft. bed. There are some fairly good inquiries from builders of automobiles and from some of the New England shipbuilding concerns.

There is to be noted no improvement in the second-hand machinery lines, and some very good bargains are offered, according to the dealers, who realize that this is the season and practically their last opportunity to dispose of worn machines where installations of new tools would be the rule in busy times. In the line of new machinery dealers are selling some special types and standard machines, and as a rule maintaining prices, so far as can be learned.

Manufacturers of ice refrigerating machinery are enjoying a splendid run of business; indeed, according to reports, this branch of manufacturing sees no ill effects of the depression. Makers of electrical power machinery in units of from 1 to 60 hp. are also having a good run of work, with an increasing tendency.

Jobbing foundries as a rule are still plodding along with two and three heats per week, and while their owners are not pessimistic, do not look for permanent improvement earlier than next year.

The Cincinnati Chuck Company is now working full time, 55 hr., with a full force, and with the best prospects in its history. Some important improvements have recently been made in its product and some others are contemplated in the near future.

The Lunkenheimer Company, manufacturer of engineering and brass specialties, is now working 80 per cent. of its maximum force, the record of boom times, and on its regular schedule of 55 hr. Officials are quite pleased with recent orders, which are of themselves sufficient in volume to warrant the constant employment of the shop forces for two months without additional business. The company has kept its skilled forces intact during the months of depression, and has built up by degrees during the summer various architectural features of its plans for the big Lunkenheimer colony in North Fairmount. The brass foundry building, in which will be housed all the latest scientific features known to brass molding, modeling and shaping, is rapidly nearing completion. It will, when completed, be the largest concrete

and steel building in the world dedicated solely to the handling of brass foundry work.

The J. M. Robinson Mfg. Company, Cincinnati, builder of metal working machinery, reports good inquiry and the distribution of some business in special dies. This company has enjoyed a very good run of business since the first of the year.

The Cincinnati Punch & Shear Company has put in a new boiler and engine and reorganized and straightened up all departments of its plant. It has built a special boring and milling machine adapted to its special purposes, which is claimed to be a very economical and much appreciated improvement. Among some late shipments of punches and shears by this company are a double 30-in. punch to the Isthmian Canal Commission; a double 36-in. punch, Williamette Iron Works, Portland, Ore.; single punch, Gross-Cooper Safe Company, Hillsboro, Ohio; single punch, John Blue, North Carolina; single punch, Fayetteville Plow Works, Fayetteville, Tenn.; gate shear, Rochester Electric Motor Company, Rochester, N. Y.; single punch, Bridgewater Plow Corporation, Bridgewater, Va. Part of this business was in stock and a part built to order.

The Steptoe Shaper Company enjoyed a week of excellent business as compared with that of the week previous. Sales of shapers included one 24-in. triple gear for shipment to Paris, France; one 16-in. single gear to Rotterdam, Holland; one 16-in. to Montreal, Canada; one 25-in. back gear shaper for shipment to San Francisco, and one 16-in. back gear to go to the Gordon Motor Company, Richmond, Va.

The Scott Stove & Furnace Company, Cambridge City, Ind., has recently closed an order for a considerable tonnage of castings for delivery to the Krell-French Company of Newcastle, Ind., manufacturer of pianos and players, and reports from the Indiana city indicate that the first named concern has grown perceptibly ever since organization and that an enlarged factory is one of the future possibilities.

The following officers were elected at the annual meeting of the directors of the Toledo Machine & Tool Company, held recently: President, E. P. Breckenridge; vice-president and manager of the works, H. J. Hinde; secretary-treasurer and general manager, Graff M. Acklin; directors, the foregoing and S. D. Carr and L. J. Hinde. H. J. Hinde was formerly superintendent of the plant and L. J. Hinde was a traveling salesman for the company.

The Standard Bronze & Brass Company has opened an office and foundry at 87 West Broad street, Columbus, Ohio. The company will deal in brass, bronze, aluminum and copper castings and make a specialty of standard manganese bronze.

The report from Columbus, Ohio, referred to in our last issue, that the Ralston Steel Car Company had received an order from the Lackawanna Railroad Company for 30 cars was incorrect. The mistake arose from the fact that an order for some cars was placed with the Ralston Steel Car Company by the South Buffalo Railway Company, which is a constituent company of the Lackawanna Steel Company.

New England Machinery Market.

WORCESTER, MASS., September 22, 1908.

The machine builders are probably selling more tools than they were, taking the trade as a whole, but the difference is slight, and does not include all of the important manufacturers. One of the large lathe builders reports that while there was a constant acceleration in orders during July and August as compared with June, September has fallen off. But this is the extreme case; in few others has there been a decrease. The usual experience is a slight betterment, either in a steady access of new business or in spasmodic periods when orders are received in quite satisfactory volume. The more special lines appear to be faring best of all, especially where they hit the wants of the automobile builders. The indications multiply that this industry will continue to exert a most beneficial influence on the machinery market as well as on various other lines of manufacturing. One such case is that of the Norton Grinding Company, Worcester. The company, besides building cylindrical grinding machines, makes a specialty of grinding crank shafts for automobiles. Never has it had so many orders in this department. Some 50 hands are employed on the work, and a part of the roughing work is done on an overtime basis. It is interesting to note that the automobile builders are specifying even narrower limits on this work, requiring a very high degree of precision. The Norton Grinding Company also finds an increasing demand for its grinding machines, although business is still far from normal.

The machinery dealers report no great change in either direction in the volume of their business. The supply trade is feeling a little better, some orders indicating an inclination to buy in somewhat larger lots. The general feeling is that the national election is exerting an influence on the

market in the way of inducing buyers to hold off a little while longer.

The American Metal Stamping Company, Worcester, Mass., has been organized to manufacture stamped metal specialties. The business will be located at Worcester, but no site has been selected. The company will require presses and other equipment. Isaac Grodberg is president; Adolph Hirsch, treasurer, and Harry E. Dann, clerk. The present office is 43 Pleasant street.

The Rocky Hill Hardware Company, Rocky Hill, Conn., has been organized to manufacture garment hangers and other novelties. Frank E. Holmes is president; John A. Ellis, treasurer, and Henry G. Miller, secretary.

The pressed steel manufacturers are experiencing a constant increase in business and most, if not all, of them are quite busy, though they cannot be said to be rushed with orders. As a matter of fact, this line of industry has not suffered to the same extent as most other branches of metal manufacturing, a fact which is not easy of explanation. Pressed steel enters into a very wide field of production which is close to the retail buyer, an element that may in part account for a condition regarded as enigmatical. The trade has been rather an important buyer in the market, everything considered, and promises to become a much more conspicuous figure in the near future.

The great forest fires of northern New England have destroyed a large amount of lumber mill property, including some plants of considerable magnitude. Coupled with this have been other fires destructive of wood working plants. Most of these losses will have to be made good by the purchase of new machine and power equipment, totalling comparatively large figures.

The Flexible Tire Company, 310 Main street, Springfield, Mass., has acquired a factory property, and states that it will require machine tools, including lathes and screw machines. The list is not ready, but probably will be within a month.

The second annual Industrial Show will be held at Foot Guard Hall, Hartford, Conn., November 14 to 19, inclusive, under the management of R. B. Jacobs, of the Jacobs Church Company, who conducted last year's exhibition. The former pronounced success insures an even greater representation of New England and other industries. Metal working machinery occupied a very important place in 1907. Not only did the machine builders of Hartford and vicinity enter into the enterprise with elaboration of display, but their colleagues from other places were present with their products, so that an unusual assemblage of modern tools resulted, in combination with other manufactured articles.

The American Mfg. Company, West Cheshire, Conn., manufacturer of novelties from sheet brass and steel and brass castings, which has incorporated its business under Connecticut laws with \$8000 cash capital, has organized with Joseph H. Beaulieu, Waterbury, Conn., as president; Richard E. Modrow, West Cheshire, secretary, and George Hauser, Waterbury, treasurer. The business was established four years ago. The company states that it is not at present in the market for equipment, with the exception of some finishing tools for plumbing supplies.

The Nashawaug Electric Power Company is to establish a large electric power plant, at Killingly, Conn., where a water privilege has been purchased. The water will be auxiliary to steam, it is understood, and will develop about 300 hp. Another privilege on the same stream has been secured, and will be held for reserve purposes. Power has already been contracted for by large cotton mills, and it is also proposed to sell power for general purposes in the towns of Killingly, Plainfield, Canterbury and Griswold. Grosvenor Ely, Norwich, Conn., is president of the company, and Frank B. Perry, Boston, secretary.

The William J. Smith Company, New Haven, Conn., has appointed as its Pacific Coast agent for the sale of Smith One-Lock adjustable reamers Fred. Ward & Son, Inc., First and Howard streets, San Francisco, Cal.

Philadelphia Machinery Market.

PHILADELPHIA, PA., September 22, 1908.

Business continues to drag along from week to week without any appreciable change. Sellers report it difficult to get buyers to the point of placing orders. However, persistent a seller may be, it is hard to get a final decision, even after a prospective buyer comes into the market, unless he is actually in urgent need of the equipment. Sales recently, therefore, have been on a comparatively small scale, and it is difficult to measure the condition of the trade by week to week observations, as the margin is in many cases very finely drawn. The outlook is more encouraging, not that it is likely that any heavy buying movement will start in the immediate future, but in that there have been placed during the week some few orders which should help business in certain directions. The shipyards in this section have recently been favored with several orders from the Government, for both colliers and torpedo boat destroyers. Three of the

former will be built by the Maryland Steel Company, while two torpedo boat destroyers will be built by each the Wm. Cramp & Sons Ship & Engine Building Company and the New York Shipbuilding Company, which will insure more active conditions in the local shipbuilding industry. This is viewed with satisfaction by the trade, as it can hardly expect a revival in buying of machine tools until the industrial plants show greater forward movement than has recently been the case. The lack of buying on the part of the railroads holds back to a large extent more activity on the part of many industrial plants, and also holds the usual direct purchases of the railroads at a low ebb. Better conditions have recently developed at the railroad shops, and while there has been no immediate improvement in the machine tool trade generally the outlook is considered much brighter, although it is believed that little actual business of importance will be done until after the Presidential election.

Machine tool builders generally show no increase in productive capacity, and in some cases have difficulty in maintaining their present rate of output. They are encouraged somewhat by recent inquiries, quite a few having developed from the Government and from some of the large steel plants. Special tool makers, particularly those turning out the heavier class of equipment, also report better inquiries, but actual orders in most cases are rather difficult to close.

A fair run of business continues to develop in second-hand machinery. Trade cannot be called active, but there is a comparatively good demand, particularly when the condition of the general trade is taken into consideration. Sales have covered a wide range of tools and equipment, and are largely single tool propositions. There have been more inquiries about recently for boilers and engines, both new and second-hand, but it is largely in the medium powers. Some inquiries for additional power equipment for plant betterment are also to be noted, but orders are still pretty scarce, although the trade is encouraged by the outlook.

The iron and steel casting plants continue to book a trifling more business, but feel greatly the absence of railroad, locomotive and machine tool builders' orders. Jobbing foundries have taken on a shade more work, but the demand from the machine tool end of the trade is pretty light.

In connection with the biennial convention of the International Union of Steam Engineers, which was held in this city the past week, an exhibition of steam supplies and equipment was held in the Dobson Building, 809-811 Chestnut street, which was very creditable. The exhibition was the first that has been held in connection with the meetings of the organization, and displays were made by a number of local and out of town manufacturers and representatives of engineering specialties. Among these were H. B. Underwood & Co., exhibiting portable boring and crank pin turning machines; Crane Company, showing the Crane tilt multiple system for returning condensation to boilers; Harrison Safety Boiler Works, the Cochrane feed water heater and separator; Cyrus Borgner Company, firebrick shapes and special reciprocating rear combustion arches of a new type for boilers; Schutte & Koerting Company, valves, &c.; A. W. Findlay & Co., special hose connections; Philadelphia Flexible Metallic Tubing Company, flexible tubing; A. B. Botfield & Co., patent grate bars; Jno. R. Livezy, cold storage and boiler coverings; Watson & McDaniel, C. J. Ramier & Co., and J. E. Lonegan, steam specialties; Anderson & Gaylord, valves; T. T. Burchfield & Co., engines and boilers; Manning, Maxwell & Moore, valves, machinery and specialties. While the foregoing represent the principal local exhibitors, others who made displays include the Berry Engineering Company, Chester, Pa.; L. J. Wing Mfg. Company, New York; Hewes & Philips Iron Works, Newark, N. J.; Chapman Valve Company, Indian Orchard, Mass.; Warren Webster & Co., Camden, N. J.; H. W. Johns-Manville Company, New York; Charles A. Shieren Company, New York; American Flue Cleaner Company, Trenton, N. J. Many of the various oil manufacturers, as well as the manufacturers of packing, were also numbered among the exhibitors. The exhibition was largely attended by the delegates and those interested in the trade.

The Borough of Haddonfield, N. J., will receive proposals, addressed to J. Morris Roberts, Mayor, for material and labor in connection with the installation of a municipal water works system. Bids will be received until October 6. The work includes the following items: About 11 miles of cast iron or other approved pipe, also special castings, valves and fire hydrants; power house and foundations; stand pipe, 25 ft. diameter by 110 ft. high; laying all pipe lines; two 1,000,000-gal. pumping units, steam, gas producer or gasoline, and two or more artesian wells. Specifications may be obtained from Allen Clymer, Borough Clerk, Haddonfield, N. J.

Proposals will be received by the Trustees of the State Hospital for the Insane, Danville, Pa., until September 30, for the construction of a sewage disposal plant for that institution. Plans and specifications may be obtained from the office of the superintendent, or Charles F. Mebus, 908 Land Title Building, this city.

Papers have been signed, we are informed, transferring the plant of the Johnson Railroad Frog & Switch Company,

Chester, Pa., to the Williams Fuel Saving Power Company, of this city, which will use the plant for the manufacture of its appliances.

Horace Trumbauer, architect, will ask for bids in the near future for estimates on a seven-story brick and stone addition to the Union League Club in this city. Among the equipment required will be steam, electric light, refrigeration and laundry plants, which are to be located in the basement of the building.

The Wm. Steele & Sons' Company, engineer and contractor, has been awarded the contract for the six-story concrete warehouse, 100 x 180 ft., which is to be erected for the C. C. Knight Company, iron and steel merchant, at Sixteenth and Callowhill streets, Philadelphia.

The Monarch Emery & Corundum Wheel Company, Camden, N. J., reports business of materially greater volume than earlier in the year. The increase has been gradual and now every department of the plant is on full time. The export trade is improving steadily, and the company is now shipping grinding wheels of all shapes and sizes to all parts of the United States as well as to many foreign countries. In order to expedite the handling of its business in the West, the company has recently established agencies with the McDowell & Stocker Company, Chicago, Ill.; R. W. Green Railway Company, St. Louis, Mo., and R. A. Williams Company, Cleveland, Ohio.

The County Commissioners at Norristown, Pa., have awarded the contract for the superstructure of the new bridge over the Manatawny Creek, near Pottstown, Pa., to the McClintic-Marshall Company, Pottstown, Pa., while the substructure will be built by J. H. Smith, Perkiomenville, Pa.

Government Purchases.

WASHINGTON, D. C., September 22, 1908.

The Isthmian Canal Commission will receive bids until October 19, Circular No. 470, for a rock crushing plant.

The Isthmian Canal Commission will receive bids until October 16, Circular No. 469, for two clam shell dredge machines, with boilers.

The Isthmian Canal Commission will receive bids until October 12, Circular No. 468, for guide derricks and hoisting engines, steam hammer, shop machines, pneumatic tools, generator and engine, electrical supplies, jacks, track drills, rail benders and other supplies.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until October 10 for two boilers, with stokers and superheaters, for the Boston navy yard.

The Isthmian Canal Commission will receive bids until September 28, Circular No. 469A, for three locomotive coaling cranes.

The constructing quartermaster, Tacoma substation, Washington, D. C., will receive bids until September 30 for an air compressor for Fort Washington, Md.

The Isthmian Canal Commission will soon ask bids for a 14 in. by 10 ft. engine lathe and a pneumatic center grinder for the Porto Bello machine shop.

The following bids were opened September 15 for machinery for the navy yards:

Class 11.—One steam locomotive crane—Bidder 3, American Hoist & Derrick Company, St. Paul, Minn., \$8025; 17, Browning Engineering Company, Cleveland, Ohio, \$7695; 111, Harron, Ricard & McCone, San Francisco, Cal., \$7940; 117, Interstate Engineering Company, Bedford, Ohio, \$6400; 119, Industrial Works, Bay City, Mich., \$8675.

Class 21.—One compressed air locomotive—Bidder 99, Henshaw, Bulkley & Co., San Francisco, Cal., \$2695; 24, Vulcan Iron Works, Wilkes-Barre, Pa., \$3000.

Class 31.—One engine lathe—Bidder 99, Henshaw, Bulkley & Co., San Francisco, Cal., \$5385, \$5370 and \$5430; 140, Manning, Maxwell & Moore, New York, \$7850; 173, Niles-Bement-Pond Company, New York, \$5480 and \$4772.

Class 32.—One steam hammer—Bidder 99, Henshaw, Bulkley & Co., San Francisco, Cal., \$565; 145, Morgan Engineering Company, Alliance, Ohio, \$785; 149, Manning, Maxwell & Moore, New York, \$667; 173, Niles-Bement-Pond Company, New York, \$558; 184, Pacific Tool & Supply Company, San Francisco, Cal., \$625.

Class 51.—One electric traveling crane—Bidder 1, Alliance Machine Company, Alliance, Ohio, \$2816; 25, Alfred Box & Co., Philadelphia, Pa., \$3150; 44, Case Mfg. Company, Columbus, Ohio, \$2900; 48, Cleveland Crane & Car Company, Wickliffe, Ohio, \$2445; 83, Fairbanks Company, New York, \$2454; 97, Hoisting Machinery Company, New York, \$2980; 145, Morgan Engineering Company, Alliance, Ohio, \$3425; 149, Manning, Maxwell & Moore, New York, \$3197; 160, Northern Engineering Works, Detroit, Mich., \$3340; 173, Niles-Bement-Pond Company, New York, \$3225, \$2970 and \$2850; 179, Ole K. Oleson, New Orleans, La., \$3000; 230, William Sellers Company, Philadelphia, Pa., \$3200; 251, Whiting Foundry Equipment Company, Harvey, Ill., \$3430.

Class 121.—Two patternmakers' lathes—Bidder 76, Fox Machine Company, Grand Rapids, Mich., \$295; 77, J. A. Fay & Egan Company, Cincinnati, Ohio, \$410; 79, Frevert Machinery Company, New York, \$296; 85, Fairbanks Company, New York, \$285; 112, Hill, Clarke & Co., Boston, Mass., \$265.50; 114, Handian-Buck Mfg. Company, St. Louis, Mo., \$430; 153, Motley, Green & Co., New York, \$250; 178, Oliver Machinery Company, New York, \$329 and \$379; 196, Prentiss Tool & Supply Company, New York, \$292.50.

Class 131.—One vertical centrifugal pump—Bidder 83, Fairbanks Company, New York, \$1070; 137, Lake City Engineering Company, Erie, Pa., \$627.61 and \$641.14; 165, National Electrical Supply Company, Washington, D. C., \$762.

Class 182.—Two hydraulic jacks—Bidder 24, Bethlehem Steel Company, South Bethlehem, Pa., \$300 and \$320; 80,

George S. Fowler, Washington, D. C., \$25; 202, J. B. Roache, Brooklyn, N. Y., \$278.

Class 195.—Two electric motors—Bidder 92, General Electric Company, Schenectady, N. Y., \$475; 232, Western Electric Company, New York, \$607.02; 254, Wagner Electrical Mfg. Company, St. Louis, Mo., \$849.54.

The following bids were opened September 14 for supplies for the Isthmian Canal Commission, Circular No. 462:

Class 34.—Six pneumatic air drills—Bidder 19, Chicago Pneumatic Tool Company, New York, \$315; 23, Cleveland Pneumatic Tool Company, Cleveland, Ohio, \$320; 47, Independent Pneumatic Tool Company, Chicago, Ill., \$287.40; 48, Ingersoll-Rand Company, New York, \$378 and \$405; 93, Standard Railway Equipment Company, St. Louis, Mo., \$450.

Class 38.—Four marine motors—Bidder 8, William C. Barker Company, New York, \$667.75; 31, Fairbanks Company, New York, \$983.50; 32, Fairbanks, Morse & Co., Chicago, Ill., \$970; 37, Gas Engine & Power Company, New York, \$1495; 58, Manning, Maxwell & Moore, New York, \$719; 97, Tasker & Strawbridge, Philadelphia, Pa., \$1335; 115, O. A. Danzenbaker, Washington, D. C., \$1660; 122, August Mietz, New York, \$1983.

Class 40.—Two wet emery grinders—Bidder 31, Fairbanks Company, New York, \$140; 35, Fox Bros. & Co., New York, \$157.08; 42, Handlan-Buck Mfg. Company, St. Louis, Mo., \$214 and \$192; 63, Motley, Green & Co., New York, \$132; 102, Tucker Tool & Machine Company, New York, \$102.90, \$93 and \$66.75; 106, Fred Ward & Son, San Francisco, Cal., \$191.80.

The following bids were opened by the Commissioners of the District of Columbia, Washington, D. C., September 14, for two vertical engines for the electric generating plant, Washington:

Ball Engine Company, Philadelphia, Pa., \$8944 for both; Sheppard Engineering Company, Williamsport, Pa., \$2563 each; B. F. Sturtevant Company, Hyde Park, Mass., \$5090 for both.

Bids for furnishing two 4-hp. oil engines for the Plymouth, Mass., light station were opened August 28 by the lighthouse engineer, Boston, as follows:

Frank E. Davis, Boston, Mass., \$704, accepted; De La Vergne Machine Company, New York, \$774.

The Oil City Boiler Works, New York, has been awarded contract for two watertube boilers for the power plant of the new National Museum Building, Washington, D. C.

The Wellman-Seaver-Morgan Company, Cleveland, Ohio, has been awarded contract for the construction of a derrick at the Bremerton navy yard for \$230,000.

Under bids opened August 11 for machinery for the navy yards, Manning, Maxwell & Moore, New York, has been awarded class 4, one Dow vertical triple plunger pump, \$442.45.

Under opening of August 25 for machinery for the navy yards, the S. O. Wood Machinery Company, South Boston, Mass., has been awarded class 132, one plug machine, \$995.

The following awards have been made for machinery for the navy yards, bids for which were opened September 1:

Prentiss Tool & Supply Company, New York, class 21, one patternmakers' lathe, \$123.

H. B. Smith Machine Company, Smithville, N. J., class 22, one saw bench machine, \$203.

Fairbanks Company, New York, class 23, one semi-enclosed motor, \$190; class 27, one electro magnetic separator, \$207.

Ole K. Oleson, New Orleans, La., class 24, one dust collector, \$75.

Vermilye & Power, New York, class 26, one metal band saw, \$98.

The following awards have been made for a number of oil furnaces for the Isthmian Canal Commission, bids for which were opened September 8:

Manning, Maxwell & Moore, New York, item 1, one crucible melting furnace for a No. 80 crucible, \$150; item 2, one forge furnace with two charging floors, \$245; item 4, one bolt heading furnace with two opposite charging openings, \$150; item 6, one brazing furnace, \$150; item 8, one portable furnace for locomotive repair work, \$140.

Kenworthy Engineering Company, Waterbury, Conn., item 3, one bolt and rivet making furnace with two charging openings on sides, \$325; item 5, one forge furnace with two opposite charging openings, \$600.

Items 9, 10 and 11 have been canceled and purchase made in open market from the Rockwell Furnace Company, New York, as follows: Item 9, one rivet heating furnace with one charging opening, \$100; item 10, one rivet heating furnace with two charging openings, \$115; item 11, one portable rivet heating furnace to be used with pneumatic riveter, \$95.

Large Reversing Engine to Be Inspected.—Mackintosh, Hemphill & Co., Pittsburgh, have sent out an invitation for an inspection of their works at Twelfth and Etna streets, Saturday, September 26, from 9 a.m. to 5 p.m. There will be on view a twin tandem compound condensing, direct connected reversing engine, built for the Duquesne Works of the Carnegie Steel Company. The firm has furnished a similar engine for the new Aliquippa plant of the Jones & Laughlin Steel Company. The engine is said to be the largest and heaviest of its type ever built and has some special features. It is designed to operate under a steam pressure of 150 lb. per sq. in., and to develop efficiently 20,000 hp., while running at 100 rev. per min. It is equipped with piston valves placed underneath the cylinders, which is a radical departure in the construction of this type of engine. The firm expects to ship the engine to the Duquesne Works during the coming week.

HARDWARE

MUTUAL fire insurance in the Hardware trade has been phenomenally successful. The amount of insurance in force with the National Company and the various State companies is large and rapidly increasing. The cost of the insurance when the rebates are taken into account is greatly less than that in the stock companies. No suspicion has been cast on this form of insurance by the failure or embarrassment of any company and no legitimate fire loss has been repudiated or defaulted. The management of the companies, too, has been wise and conservative, so that the whole movement is commended to the trade. In addition to this success, when the matter is viewed simply as a business proposition, the various Hardware insurance companies have been most potent factors in the building up of associations. Membership in a State association being presupposed, merchants have found in the cheapness and merit of Hardware insurance a reason for joining a movement identification with which costs something, but which, while it may be enjoyable as appealing to the spirit of fraternity and comradeship, and useful in its educating influence and its power to correct trade abuses, does not afford anything in the way of immediate financial return. The opportunity to secure insurance, sometimes at half the cost of regular insurance, is a definite financial reason for association membership.

In view of the comparative inexpensiveness of conducting these companies and the further fact that Hardware stores are a peculiarly desirable risk, it is possible for this insurance to be furnished safely at a cost materially less than that of the stock companies which take all kinds of risks and whose methods of carrying on their business are necessarily very expensive. The Hardware insurance companies are therefore enabled to furnish insurance at a price ranging from 33 1/3 to 50 per cent. less than the stock companies. In this condition of things it is safe to anticipate a further growth in this Hardware insurance, provided only wise counsels prevail and the movement is not discredited by recklessness in management.

There is, however, in the very attractiveness of the proposition a danger which should not be lost sight of. Rebates of 50 per cent. are being paid by some of the companies. This furnishes insurance at one-half of the cost of insurance in the regular companies. While not all the Hardware insurance companies are giving so large a rebate, this is apparently getting to be the ideal rebate. Companies who have not yet reached quite so low a cost are hoping to do so in the near future. A 50 per cent. rebate seems to be coming to be regarded as the proper thing. There have even been intimations that a greater rebate, even up to 75 per cent., is not out of the question.

In this condition of things there is danger. The payment of too large rebates will be at the expense of the establishment of a substantial surplus, which in the long run will probably be essential to the stability of the company. It may be all right while everything goes well, but the future is full of vicissitudes, and in time of stress, difficulty, if not disaster, may overtake those

who have little to fall back upon. There will be years of excessive loss when a surplus will be needed to keep up rebates. Strength and financial stability, together with liberality and reasonable price, is what the companies should aim at. This, too, is what the policy holders should call for, rather than low cash insurance. In these days when things are going prosperously, though not quite so prosperously even in insurance matters as heretofore, and the trade have fullest confidence in the companies, and are justified in having such confidence, it is important that this principle should be recognized and that a conservative policy should be pursued.

Condition of Trade.

The country is apparently not digesting goods quite as rapidly as in periods of entire healthfulness in commercial conditions. While there is a fair trade doing between the jobbers and their customers the former are not finding it necessary to send in to the manufacturers very voluminous orders, and in general the pace which characterized trade for a week or two in August seems to have relaxed a little. Everything, however, depends upon location and special circumstances and conditions. While the agricultural sections with the prospect of marketing good crops at good prices suffer only a moderate depression, which leaves a fairly satisfactory business to be taken care of, manufacturing towns and cities generally report a good many men idle or only partially employed, and few factories running on full schedule. Politics may be credited with diverting some attention from business, and there is a possibility that as the canvass warms up the election may have something of its traditional influence in interfering with the regular movement of trade. So far as Hardware is concerned, it is safe to say that it is keeping up well, as compared with other lines of trade, and that it is having its full share of the gradual recovery which is to be noted throughout the country, a recovery which is not to be gauged entirely by the somewhat fluctuating volume of current business. There is to be noted in the Hardware field a pretty satisfactory condition, so far as prices are concerned. Reaction from extreme low prices is observed in several lines, with a general desire on the part of manufacturers to avoid unnecessary slaughtering of prices, and a determination to pursue a conservative course and be content with a portion of the business going. There are at this time, as usual, lines in which somewhat demoralized conditions prevail, and viewed as a whole the market is one which calls for rare judgment in determining purchases and skill in placing orders to the best advantage. There is abundant evidence that many retail merchants are pursuing a wise course in the existing state of things and are reaching out with enterprise and energy, endeavoring to make up in this way for any tendency toward sluggishness in trade along the regular lines. Winter goods are naturally moving quite freely, and preparations for the holiday trade are in evidence.

Chicago.

Reports from the leading Hardware distributers in this market covering results of the past week are decidedly more uniform and positive in indicating an increased volume of business. Orders, it is said, are not only more numerous, but are averaging somewhat better in size. And that a stronger sentiment of confidence per-

vades the market is evident from the more favorable views expressed respecting the trend of trade in quarters where, for months past, extreme conservatism has verged close upon pessimistic doubt. The movement of fall goods is growing and is even now fairly active, though the proportions of shipments on contract specifications is lighter than usual at this season; this is obviously due to the conservatism of buyers in estimating forward requirements. The effects of expansion in building operations are seen in an improved demand for Builders' Tools. Building permits in Chicago issued during July and August surpassed both in number and cost those of the same months last year; and a significant fact in this connection is that this result was not achieved by inclusion in the totals of any buildings of extraordinary size, but is due rather to a marked increase in the construction of dwellings, apartments and other moderate medium sized buildings. Following close upon an advance in the price of Machine and Carriage Bolts, reference to which was made in last week's report, the trade is again in receipt of revised discounts which make effective another raise of $\frac{1}{2}$ per cent. on Bolts and 5 per cent. on Lag Screws. This action, it is claimed, was dictated by the necessity of restoring prices to a level that would yield manufacturers a reasonable margin of profit, which it seems has been well nigh eliminated by recent competition. Preparations for the fall Stove trade has stimulated the movement in Black Sheets of Stove Pipe sizes, No. 26 and No. 27 gauges, which are now in more general demand, though orders are usually for lots of moderate size. While but little talk of politics is heard, there is no doubt but that some market hesitancy is inspired by the uncertainty which always attends, to a greater or less degree, the outcome of Presidential elections. About the only instance of favorable influence being exerted upon the Hardware trade by the political controversies now being waged, is in the creation of a demand for campaign Cutlery. Knives bearing the names of prominent candidates seem to have filled the gap created by the disappearance of tin torches formerly used in torch light processions. So far at least as the Central West and the territory embraced in the Mississippi and Missouri River valleys are concerned, conditions are nearer normal than they have been since the panic of last year; and to the eastward signs of returning activity are not wholly lacking. Surrounded by such concrete proofs of material wealth as is manifested in the abundant products of field and farm, it is indeed something of a mystery to a greater part of the rural population in this wide region why the wheels of industry have seemed to drag and creak complainingly as if weighted and restrained by powerful unseen, retarding forces. But whatever the flaws in our economic system that were responsible for all this it is at least certain that the mainstay of the whole industrial structure has been and still is the stable wealth of agriculture.

NOTES ON PRICES

Wire Nails.—Demand continues in about the same volume as for the past few weeks, showing a free movement of Nails on new business and contract orders. In new orders small quantities predominate, and prompt deliveries are requested, indicating conservatism on the part of buyers and an intention to keep stocks down to moderate proportions. Prices are well if not inflexibly maintained by all. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$1.95
Carload lots to retail merchants.....	2.00
Less than carloads to jobbers.....	2.00
Less than carloads to retail merchants.....	2.10

New York.—Local demand is reported as having been very good last week, but not so active at the present time. The quantity purchased by retail merchants would possibly sort up stocks for a week or more. Nails are held on the basis of \$2.30 per keg in small lots at store.

Chicago.—New business in Wire Nails is being well sustained and shows no declining tendency. Thus far, the tonnage for September is about even with August for the

corresponding period. Buyers recognize the wisdom of conservatism in estimating future requirements, and, being under no necessity of ordering far ahead to maintain stocks, are buying in small lots for present needs. Prices, we are advised, are being steadily maintained. Quotations are as follows: \$2.13 in car lots to jobbers, and \$2.18 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—A fair amount of new business is being placed, but orders so far this month have not been as plentiful as in the same period in August. The American Steel & Wire Company and the Pittsburgh Steel Company, the two largest makers of Wire Nails, are operating their plants to nearly full capacity, and Nails are moving out freely on new orders and on specifications against contracts. Most new orders being placed are in small lots for actual needs, the jobbers asking for early deliveries, indicating that stocks are light and that they have not much intention of increasing stocks for the present at least. We are advised that the leading makers of Wire Nails are absolutely maintaining regular prices. Quotations for base sizes are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$1.95
Carload lots to retail merchants.....	2.00

Galvanized Nails are quoted at \$1 over the price of the regular Nails.

Cut Nails.—Nothing was done in regard to changing prices at the meeting of the Eastern Cut Nail Association held last week, former quotations being reaffirmed. In the West an improvement in demand is apparent, but in the East requirements do not seem to be on the increase. All orders are for small lots, which shows that buyers are not accumulating stocks. The general market is represented by the quotation of \$1.80, base, per keg, f.o.b. Pittsburgh, but \$1.75 is the extreme market, on carloads and over, to the large trade. In the Western market Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails, but this differential is not observed in the East.

New York.—Conditions remain unchanged in the local market and demand is restricted to actual requirements. Nails are held on the basis of \$2.15 per keg for small lots at store.

Chicago.—Though the demand is by no means on a parity with that for Wire Nails, there is a marked improvement over conditions of a few weeks ago. Orders are chiefly for small lots, and buyers are not extending their purchases beyond present requirements. Except for a possible shade of 5 cents a keg on especially desirable specifications prices are fairly represented by the following quotations. We quote Chicago prices as follows: In car lots to jobbers, Iron Cut Nails, \$2.08; Steel Cut Nails, \$1.98. In small lots from store: Iron Cut Nails, \$2.25; Steel Cut Nails, \$2.15.

Pittsburgh.—Business seems to have fallen off this month, as compared with the first half of August, but some small orders for current needs are being received by the mills right along. These are mostly for prompt shipment, and show that stocks held by jobbers are light. The general market is represented by the quotation of \$1.80, base, per keg, f.o.b. Pittsburgh, but \$1.75 is the extreme market, on carloads and over, to the large trade. In the Western market Iron Cut Nails are held at an advance of 10 cents per keg over Steel Cut Nails, but this differential is not observed in the East.

Barb Wire.—The improvement in demand anticipated by manufacturers lags, and orders from jobbers are, in most cases, for small lots. Regular quotations are reported as being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Painted.	Gal.	
Jobbers, carload lots.....	\$2.10	\$2.40
Retailers, carload lots.....	2.15	2.45
Retailers, less than carload lots.....	2.25	2.55

Chicago.—The demand is slowly increasing, and, thought not yet in full swing, a fairly satisfactory trade is looked for when fall buying is fully under way.

throughout the West. Prices, it is stated, are being firmly maintained. Quotations are as follows: Jobbers, Chicago, car lots, Painted, \$2.28; Galvanized, \$2.58; to retailers, car lots, Painted, \$2.33; Galvanized, \$2.63; retailers, less than car lots, Painted, \$2.45; Galvanized, \$2.75; Staples, bright, in car lots, \$2.25; Galvanized, \$2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Fall demand is opening up, but so far is not as heavy as anticipated by the mills, but it is hoped will improve later. Jobbers are placing orders mostly in small lots for actual needs, and are not showing a desire to carry heavy stocks. It is said regular prices are being maintained. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.10	\$2.40
Retailers, carload lots.....	2.15	2.45
Retailers, less than carload lots.....	2.25	2.55

Plain Wire.—The demand continues in fair volume, while specifications on contract orders are quite liberal. Regular prices are reported as being maintained. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of \$1.80 for Plain and \$2.10 for Galvanized,

per pound and on Boiler Rivets of 2.10 cents per pound, both f.o.b. Pittsburgh.

Freezers.—Most manufacturers of Ice Cream Freezers are now in the market, and business for next season is being booked. The prices of the important makers are practically the same as last year.

Steel Goods.—While next season's prices on Steel Goods have not yet been generally announced, quotations have been made to the larger trade and contracts are being solicited. On some second grade goods it is said that list prices have been a little advanced. Small declines, however, are reported on a number of lines, notably Southern Hoes.

Bright Wire Goods.—The low prices which have been prevailing on Bright Wire Goods are still current. Competition on this line is, as usual, exceedingly keen. The market may be represented by a quotation ranging from 90 and 40 to 90 and 40 and 10 per cent.

Conductor Pipe, Elbows, Etc.—Referring to the advance in Conductor Pipe, Eaves Trough, Conductor Elbows, &c., announced in our last issue, we give below the new jobbing prices recommended for the different territories, which, in some cases, show a considerable advance. The discounts are as follows:

Article.	Northeastern territory.	Eastern territory.	Central territory.	North-western territory.	Western territory.	Tennessee territory.	Southern territory.	South-western territory.
Conductor Pipe:								
Galvanized Steel, standard sizes and gauges.....	70-10%	70-10-5%	75-5%	75-2½%	70-7½%	70-10%	70%	70%
Galvanized Steel, irregular sizes and gauges.....	70-10%	70-10%	75%	70-15%	70-5%	70-7½%	70%	70%
Galvanized C. C. Iron, standard sizes and gauges.....	50-10-7½%	50-10-7½%	60%	60%	50-12½%	50-12½%	50-12½%	50-5%
Galvanized C. C. Iron, irregular sizes and gauges.....	70%	70%	70-5%	70-5%	70%	70-5%	70%	65-10%
Copper, 14, 16 and 20 oz.....	50-10%	50-10%	50-10%	50-10%	50-5%	50-10%	50-5%	50-5%
Eaves Trough:								
Galvanized Steel, standard sizes and gauges.....	75-10-5%	80%	80-10-5%	80-10-5%	80-5%	80-5%	75-10%	75-10-2½%
Galvanized Steel, irregular sizes and gauges.....	70-10%	70-10%	75%	70-15%	70-5%	70-7½%	70%	70%
Galvanized C. C. Iron, standard sizes and gauges.....	60-20%	60-20%	65-10%	65-10%	60-10-5%	60-10-5%	60-10-5%	60-5%
Galvanized C. C. Iron, irregular sizes and gauges.....	70-5%	70-5%	70-5%	70-5%	70%	70-5%	70%	65-10%
Copper, 14, 16 and 20 oz.....	50-10%	50-10%	50-10%	50-10%	50-5%	50-10%	50-5%	50-5%
Ogee Box and Roof Gutter:								
Galvanized Steel, standard sizes and gauges.....	75-10-5%	80%	80-10-5%	80-10-5%	80-5%	80-5%	75-10%	75-10-2½%
Galvanized C. C. Iron, standard sizes and gauges.....	60-20%	60-20%	65-10%	65-10%	60-10-5%	60-10-5%	60-10-5%	60-5%
Plain Ridge Roll and V. Ridge Cap:								
Galvanized Steel, crated.....	.....	.....	80-10-10%	80-10-7½%	80-7½%	80-5%	80%	75-10-7½%
Galvanized Steel, wired in bundles.....	.....	.....	80-10-10-2½%	80-10-10%	80-10%	80-5-5%	80%	75-10-7½%
Galvanized C. C. Iron, crated.....	.....	.....	65-10%	65-10%	60-10-5%	60-10-5%	60-10-5%	60-5%
Formed Valley:								
Galvanized Steel.....	.....	.....	75%	70-15%	70-5%	70-2½%	60-20-5%	60-10-7½%
Galvanized C. C. Iron.....	.....	.....	50-5%	50-5%	40-10%	40-10%	40-10%	40-2½%

f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12 & 12½	13	14	15	16
Annealed.....	\$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35
Galvanized.....	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Chicago.—Not only is the demand for Plain Wire quite active and gradually increasing, but there is a disposition among manufacturers to order in more liberal quantities. This is true of both Fence makers and manufacturers of miscellaneous Wire goods. The volume of shipments from the mills is larger than for some time. Prices are firm and unchanged. We quote as follows: Car lots to jobbers, \$1.98, f.o.b. Chicago, and to retailers, \$2.05.

Pittsburgh.—Specifications against contracts are coming in quite freely, and there is a fair run of new orders, but mostly in small lots. Buyers are insisting on prompt shipments, indicating that stocks being carried are much lighter than usual at this season of the year. It is stated that regular prices are being absolutely maintained by the mills. Quotations per 100 lb. to jobbers in carload lots are as follows, on a basis of \$1.80 for Plain and \$2.10 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the price to retailers being 5 cents additional:

Nos.	6 to 9	10	11	12 & 12½	13	14	15	16
Annealed.....	\$1.80	1.85	1.90	1.95	2.05	2.15	2.25	2.35
Galvanized.....	2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Rivets.—A movement has lately been made by the manufacturers to get somewhat better prices for Boiler and Structural Rivets. The market may now be represented by a quotation on Structural Rivets of 2 cents

Terms are as usual, 60 days, net; 2 per cent., 10 days. No freight is allowed on shipments of less than 250 lineal feet. One shipment of 250 ft. or more, full freight, is allowed to the nearest railroad station with a few exceptions. It will be noted that special prices are no longer named for Pittsburgh territory, which has been included in central territory.

Much satisfaction is felt by the manufacturers of Conductor Elbows and Shoes at the readjustment of prices on these lines after a long period of demoralization. That a material advance has been effected will be clear from the following quotations, which, however, do not represent the extreme concessions obtainable by jobbers and other large trade:

Galvanized Steel and Charcoal Iron Elbows.	
Sizes 2, 3, 4 .....	..... 80% discount
Sizes 1½, 2½, 3½, 5, 6 .....	..... 60-10% discount
26 Gauge .....	..... 50% discount
24 Gauge .....	..... 25% discount
Copper Elbows .....	..... 50% discount

Rope.—The market price on the best brands of Manila Rope has dropped to a basis of 9 cents per pound, and inferior qualities and Mixed Rope grade down to 7 cents and sometimes lower. The demand for the lower grades, for ordinary use, is on the increase from inland points, while for mechanical and marine purposes the better grades are required. Jute fiber has advanced, but manufacturers have not put up the price of Jute Rope in proportion to the advance in raw material. Demand for Rope is showing some improvement, but the volume is still below normal. General quotations for Rope 7-16 in. in

diameter and larger are as follows: Pure Manila, 9 cents; Pure Sisal, 7 cents; No. 1 Jute, $\frac{1}{4}$ in. and up, $5\frac{1}{2}$ cents; No. 2 Jute, $\frac{1}{4}$ in. and up, 5 cents.

Bolts and Nuts.—The market for Bolts and Nuts continues to reflect improved conditions, the new prices of the manufacturers being well maintained. At the same time, prices are still low and business is in moderate volume. The following discounts may be quoted as representing the manufacturers' prices to the general trade:

Common Carriage Bolts, cut thread, $\frac{1}{8}$ x 6 and smaller and shorter	75 and 10%
Common Carriage Bolts, rolled thread, $\frac{1}{8}$ x 6 and smaller and shorter	75, 10 and $7\frac{1}{2}$ %
Common Carriage Bolts, cut thread, larger and longer than $\frac{1}{8}$ x 6.....	70 and 10%
Machine Bolts, cut thread, $\frac{1}{8}$ x 4, or smaller and shorter,	75, 10 and 5%
Machine Bolts, rolled thread, $\frac{1}{8}$ x 4 or smaller and shorter,	75, 10, 5 and $7\frac{1}{2}$ %
Machine Bolts, larger and longer than $\frac{1}{8}$ x 4.....	70, 10 and 5%
Bolt Ends	70, 10 and 5%
Coach Screws, Gimlet point.....	80 and 10%
Lag Screws, Cone Point.....	80, 10 and 5%

It may be stated that somewhat lower quotations are being made by jobbers who have stocks bought and contracts placed at the extremely low prices which have been obtainable during the spring and summer. One Western jobbing house is naming a discount on smaller Carriage Bolts of 80 per cent. and on larger 75 per cent. A slight advance in Hot Pressed Nuts was made last week. The market on both varieties of Nuts may now be represented by the following quotations:

Hot Pressed Square Nuts, blank or tapped.....	5.90 off list
Hot Pressed Hexagon Nuts, blank or tapped.....	6.40 off list
Cold Punched, Plain Square Nuts.....	5.40 off list
Cold Punched Square Nuts, C. T. & R.....	5.80 off list
Cold Punched Plain Hexagon Nuts.....	6.00 off list
Cold Punched Hexagon Nuts, C. T. & R.....	6.60 off list

Window Glass.—The week has been practically devoid of developments in Glass circles. The general condition of the market remains substantially the same, about twenty hand plants being in operation, with a total capacity of a little more than 600 pots. No reports of any advancement in perfecting the organization of manufacturers have been made public. Workmen in the different branches of the Window Glass industry are working more in harmony than usual to get better wages than ruled during the last five years. Manufacturers' discounts, from manufacturers' list of January 1, 1901, are as follows: For A single and double strength Glass, 90 and 15 per cent.; for B single and double strength Glass, 90 and 20 per cent. Eastern jobbers' quotation from jobbers' list, October 1, 1903, for all sizes of single and double strength Glass, covering the territory east of Chicago, is 90 and 20 per cent. discount.

Linseed Oil.—The tendency is still to restrict purchases to immediate requirements, and these are largely confined to small lots. Quotations are as follows: State and Western Raw in small lots, 42 cents per gallon; City Raw, 44 to 45 cents, in small lots, per gallon. Boiled Oil is 1 cent advance on Raw. Carloads of Raw could probably be bought at from 1 to 2 cents less than the price for small lots.

Spirits Turpentine.—The market has advanced about $\frac{1}{2}$ -cent per gallon during the week, reflecting slightly improved conditions in the South. Demand at this point continues restricted to small lots. The New York market is represented by the following quotations: Oil Barrels, 38 to $38\frac{1}{2}$ cents; Machine Made Barrels, $38\frac{1}{2}$ to 39 cents per gallon. In view of unsatisfactory conditions which effect Turpentine producers in the State of Florida, there is a movement on foot to organize a corporation to be known as the Naval Stores Marketing Company. The chief object of the company, according to the present plan, will be to eliminate from the industry purely speculative manipulation and the establishment of the business upon a sound basis, where it will respond to the law of supply and demand.

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L. P. & J. S. Farley have bought the business of Wood Bros., in Corona, S. D., and will handle Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

THE MEMPHIS CONVENTIONS.

A S heretofore announced, the annual conventions of the American Hardware Manufacturers' Association and the National Hardware Association will be held simultaneously at Memphis, Tenn., November 18 to 20. Arrangements are under way which promise to make these meetings especially interesting and enjoyable. An attractive programme of entertainment is being prepared to fill in the time not devoted to business sessions, which will thus not be interfered with in any way. The committee in charge has decided that on Thursday forenoon, November 19, a card party and luncheon for ladies exclusively will be given at the Memphis Country Club, the prizes for this function being donated by manufacturers who are members of the American Hardware Manufacturers' Association. Manufacturers who are desirous of contributing prizes for the occasion are invited to do so, and it is suggested that they address George T. Bailey of the Oliver Iron & Steel Company, who is chairman of the Reception Committee, care of Columbia Club, Indianapolis, Ind., in regard to the matter. Any packages containing prizes which manufacturers may care to donate for the card party should be sent to Mr. Bailey, care of the Peabody Hotel, Memphis, Tenn., not later than November 17.

W. H. Bennett, room 403, 40 Dearborn street, Chicago, who, at a meeting of representatives of both associations at Atlantic City last year, was appointed a committee of one on transportation to complete arrangements for the Memphis meeting, has issued a circular in which he announces his intention to give the members the best possible service. If feasible he will run a special train from New York through to Memphis via Chicago. It is planned to have this train leave New York City via the New York Central lines on Saturday morning, November 14, arriving at Chicago on Monday morning, November 16. Leaving there on Monday evening, it is due to arrive in Memphis on the following day. The interval of time between the arrival and departure in Chicago will be filled in by viewing the sights of the Windy City with a delegation of Chicago Hardware merchants as hosts. Arrangements will be made to have this special train stop at cities between New York and Chicago for parties who desire to join the company en route. Those coming from the West and Northwest will join the party at Chicago. The question of rates is now being considered by the different railroad passenger associations and definite information as to the cost of the trip and the exact schedule of the train will be given later. Those who desire reservations made on this train should communicate with Mr. Bennett as early as possible.

The first session of the meeting of the National Hardware Association will be held on Wednesday forenoon, November 18, and, as usual, will be open not only to the members, but to all visitors to the conventions. Executive sessions will be held on Wednesday afternoon and on Thursday and Friday, both morning and afternoon, during which many important subjects relative to the work of the organization will be discussed. The annual banquet will be held on Thursday evening, November 19. We are advised that there is a strong probability that Judge Taft will be present during one of the days of the convention. Already a sufficiently large number of the members of the association have engaged rooms at the Hotel Gayoso to indicate that the gathering will be largely attended.

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HARRY CLINTON GOODRICH, 140 Winchester avenue, New Haven, Conn., has begun the manufacture of the Goodrich Patent Instant Water Heater, the work being done for him by the Pfleghar Hardware Specialty Company of that city.

Pain Bros. and G. W. Woolsey have purchased the business of Munch & Co., Hennessey, Okla. Pain Bros. will occupy the store Munch & Co. used, and will also retain the one they formerly occupied, while G. W. Woolsey will move the goods purchased by him to his own store.

RURAL PARCEL POST "EXPERIMENT" THE GOVERNMENT PROGRAMME.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., September 22, 1908.

No gift of prophecy is required to predict with certainty that the coming session of Congress will be marked by one of the hardest fought campaigns in the history of the movement to secure the passage of parcel post legislation. The return to Washington of the Postmaster-General after his summer vacation is signalized by the announcement that he has secured a promise from President Roosevelt to recommend in his next annual message the establishment of an experimental rural parcel post along the lines suggested by the Postmaster-General in his letter to Senator Penrose, chairman of the Senate Post Office Committee, forwarded during the debate upon the last annual post office appropriation bill on the floor of the Senate.

Just a year ago it was announced that the President had agreed to recommend legislation to put into force the Meyer-Bristow rural parcel post project throughout the country, and retail merchants in all lines were greatly disturbed thereby. Many of them wrote to the President, expressing the opinion that not only the small merchants but the country towns and villages would suffer serious injury, and there is reason to believe that these protests were effective, for although the President kept his promise to the Postmaster-General, his recommendation appeared in his message in the following conservative form:

I further commend to the Congress the consideration of the Postmaster-General's recommendation for an extension of the parcel post, especially on the rural routes. There are now 38,215 rural routes, serving nearly 15,000,000 people who do not have the advantages of the inhabitants of cities in obtaining their supplies. These recommendations have been drawn up to benefit the farmer and the country storekeeper; otherwise I should not favor them, for I believe that it is good policy for our Government to do everything possible to aid the small town and the country district. It is desirable that the country merchants should not be crushed out.

Proposition Offered as a Compromise and Test.

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Carrying out this theory, the "uniform bill of lading" is supposed to be used with a "reduced" rate, and the rules provide that if the shipper wants to hold the railroad responsible he must pay 20 per cent. more than the regular "reduced" rates. The rates, however, are not "reduced." They are regular tariff rates filed with the Interstate Commerce Commission. Local class rates

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The whole question of the conditions that should appear in a bill of lading has been pending before the Interstate Commerce Commission for three years. Unfortunately, the commission only has jurisdiction over interstate commerce in matters pertaining to "rates, fares and charges." It has no power to regulate local State shipments, and it has no jurisdiction even when the traffic is interstate over questions of loss or damage.

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If any railroad persists in refusing to pay damage claims because of the "conditions" printed in its bill of lading, the merchant has a simple remedy to maintain his rights. He should ask the parties from whom he buys to stamp his shipping receipts or bills of lading "Accepted under protest against the conditions limiting

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RURAL PARCEL POST "EXPERIMENT" THE GOVERNMENT PROGRAMME.

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., September 22, 1908.

NO gift of prophecy is required to predict with certainty that the coming session of Congress will be marked by one of the hardest fought campaigns in the history of the movement to secure the passage of parcel post legislation. The return to Washington of the Postmaster-General after his summer vacation is signalized by the announcement that he has secured a promise from President Roosevelt to recommend in his next annual message the establishment of an experimental rural parcel post along the lines suggested by the Postmaster-General in his letter to Senator Penrose, chairman of the Senate Post Office Committee, forwarded during the debate upon the last annual post office appropriation bill on the floor of the Senate.

Just a year ago it was announced that the President had agreed to recommend legislation to put into force the Meyer-Bristow rural parcel post project throughout the country, and retail merchants in all lines were greatly disturbed thereby. Many of them wrote to the President, expressing the opinion that not only the small merchants but the country towns and villages would suffer serious injury, and there is reason to believe that these protests were effective, for although the President kept his promise to the Postmaster-General, his recommendation appeared in his message in the following conservative form:

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Bill of Lading Accepted "Under Protest."

right of contract. He must use the document which all the railroads have adopted, or they will not give him any receipt at all. Jobbers, manufacturers and other large shippers who use their own receipts bound in books usually have a separate book for each

Large Shippers Use Their Own Receipts.
which it requires. The "protest" stamped on the document by the shipper has the effect of raising all the questions of law which lie behind the "restraint of trade" when competing roads join together in an agreement to deprive the shipper or consignee of his legal common law rights.

Weed & Co.'s 90th Anniversary.

WEED & CO., Buffalo, N. Y., one of the oldest and best known hardware houses in the country, celebrated its 90th anniversary on the 23d inst. Not many houses in any line of business can point to an unbroken record of business prosperity and progress extending over nine decades. This firm has watched the forests yield to the sturdy stroke of the woodman. It sold supplies to the men who dug the Erie Canal. Through all the vicissitudes of frontier life, through storm and stress, the firm has steadily progressed from a backwoods ironmongery to a conspicuous position in the commercial life of Buffalo. Interesting indeed is the comparison between a little two-story shack of logs and frame—half blockhouse, half store—in 1818, and the great modern wholesale and retail establishment of Weed & Co. to-day.

It was shortly after Buffalo was burned by the British and her Indian allies that George T. Weed and Thaddeus Weed, on September 23, 1818, opened at the northwesterly corner of Main and Swan streets a hardware store, or ironmongery, as it was then called. The business prospered from the first day, though its customers were limited to Indians and frontiersmen. Thaddeus Weed founded Buffalo's first regular fire company and took an active interest in civic and religious life. Subsequently his son, DeWitt Chapin Weed, succeeded to the business. The demise of DeWitt C. Weed in 1880 left Hobart Weed principal owner, and in 1903 the house was incorporated, with Mr. Weed as president.

In carrying out this policy of conservatism and the furnishing of reliable goods the house adopted its birth year, "1818," as a trade mark, and the articles it sells so branded carry the fullest guarantee as to workmanship and quality. In view of this long and creditable record Weed & Co. will receive the congratulations of the trade with best wishes that they may round out their first hundred years with continued success, and enter on their second century under the most favorable auspices.

Hendricks Commercial Register.

THE SAMUEL E. HENDRICKS COMPANY, 74 Lafayette street, New York, publishing Hendricks' Commercial Register of the United States, continuing the custom of thorough revision every 12 months, has just issued the seventeenth annual edition, dating from its foundation, in 1891. In general appearance it closely resembles recent editions, and in the stiff clothbound covers contains 1340 pages, three columns to a page. This directory is particularly devoted to the interests of Architectural, Mechanical, Engineering, Contracting, Electrical, Railroad, Iron, Steel, Hardware, Mining, Mill, Quarrying, Exporting and kindred Industries, having, it is said, over 350,000 names and addresses and upward of 30,000 business classifications. A helpful feature is the insertion of trade names or brands of goods wherever practicable.

SOME resourceful rascal has lately been exercising his talents in New York City in obtaining goods under false pretenses. The facts in one instance are as follows: It was represented over the telephone that a large house uptown, with whom a certain cutlery house was continually dealing, had arranged a sale for the following day of combination pocket knives to sell at \$2.50 and \$3 each. Twelvedozen each stag and pearl, to cost not over \$21 and \$28 to \$30

per dozen, respectively, were wanted. An hour later another message came asking that the goods be put in packages for delivery to boy who would call that afternoon, as it was important the goods should be opened and marked for the morrow's sale. The boy came in due course with a written order, having been posted in advance with answers to possible questions. The boy has been arrested, but it is believed that he was merely a tool, and hired for this special errand. The cutlery firm having occasion to communicate with the house mentioned, and finding that no such order had been given, immediately telephoned the circumstances to a number of leading concerns in the trade to warn them, and, if possible, catch the thief. It then developed that another prominent house had been successfully approached a few days previously, but were keeping the facts quiet, thinking they would apprehend the man. By the same methods and doubtless by the same person 3 dozen high priced safety razors were obtained about the same time, and attempts were made unsuccessfully on another safety razor house and a Broadway cutlery establishment.

Wisconsin Hardware Association.

AT a recent meeting of the Executive Committee of the Wisconsin Retail Hardware Association, C. A. Peck, secretary, Berlin, it was decided to limit the number of papers to be read at the next annual convention in February, 1909, to one paper, not exceeding 10 min. in delivery, at each session. This will enable the convention to give considerably more time to the discussion of topics suggested by the Question Box. It is believed that by giving more attention to Question Box deliberations the interest of the members in the work of the convention will be materially increased, and they will thus be induced to take an active part in the discussions.

It had been hoped to secure the new Auditorium Building in Milwaukee for the next meeting, but the structure is so far from completion that the officers of the association have decided that it will be better not to count on that building, but to make use of the quarters heretofore employed. The Hardware exposition will continue to be a feature of the annual gathering, and every effort will be made to make it as interesting and attractive as possible. The exposition will be managed by the Milwaukee local association, under the direction of the officers of the State organization.

Mr. Peck, who is also secretary of the Hardware Dealers' Mutual Fire Insurance Company of Wisconsin, states that business so far in 1908 has been at the rate of about \$10,000 a day. A folder has lately been sent out by the company in which it appears that since January 1 last \$1,994,950 worth of insurance has been written. The dividend for 1908 is 50 per cent., and the rebates so far during the year have been \$10,703.16. Since January 1 the assets of the company have increased from \$28,123.40 to \$42,092.30.

AN IMPORTANT CONSOLIDATION of roofing interests has been effected through the organization of the General Roofing Mfg. Company, East St. Louis, Ill. This company has absorbed the Weatherproof Mfg. Company, St. Louis, Mo., of which J. S. Porter, now sales manager of the new company, was president, the Weatherproof Company losing its identity through the merger, except that the Weatherproof brands and trademark, well known to the roofing and building trade in the Central, Western and Southwestern States, will still be continued. The business of J. C. Woodley & Co., Chicago, who enjoyed a trade of similar character in the Northern States and quite extensively introduced the brand of Compo Rubber Roofing, has been taken over by the new company, and will be operated under its name as the J. C. Woodley & Co. Branch, Chicago. It will look after the territory comprised in the northern portions of Illinois, Indiana and Ohio and northwestern Iowa, Michigan and Wisconsin. All of the goods made by the company are, it is stated, manufactured from raw materials controlled by it, which is advantageous both in point of economy and maintenance of quality. The officers of the company are Geo. M. Brown, president, and M. J. Moore, secretary.

Here and There in the Hardware Store.

BY SAMUEL MASTERS.

I.—NEW METHODS AND NEW MEN.

ONE of the most significant of the changes in business which have been wrought by the introduction of modern systems is the altered relations of sales managers and salesmen and the difference in the kinds of men themselves.

Smaller Fields Better Cultivated.

There was a time when a salesman was turned loose in a territory rich enough to support a dozen men and allowed to travel about therein at his own sweet will, so long as his sales exceeded a stated minimum. Now his field is measured not only by counties and States but by the sales possibilities, and he moves about among a number of firms, carefully selected by his house, just as directed by the sales manager. He must produce orders from each firm, show conclusively that they cannot be taken, or permit another salesman to try.

The Manager Manages.

A salesman can no longer talk confidently of "my towns" or "my customers," and the instances are comparatively rare when a salesman who transfers his services to a competing house is able to divert an embarrassing amount of business from the old channel. It is becoming more and more the firm that does the business through the salesman, and less and less the salesman who commands the business for his house. Formerly the salesman frequently ruled the situation and told the manager what the house must do to command the business. Now the manager knows more of the general situation than the man in the field, and gives him explicit instructions as to what he may or may not do, and is not to be moved from his position by stories of what the "other house" is doing.

An Evolution, Not a Revolution.

There has not been a sudden revolution. It is probably 15 years since the Simmons Furniture Company pasted a series of maps on boards and traced the movements of its men thereon by means of Tacks of various kinds taken from its stock. It is at least 12 years since a Chicago furniture house began the sale of map and Tack outfits, and about as long since the card systems, used first by libraries and later by savings banks, began to be adopted for registering records of sales and solicitations. It is 17 or 18 years ago that the general scramble to change partnerships into corporations and corporations into trusts excited popular clamor, and that private agreements between competing houses as to prices, terms and territory, put the sales manager into a position to know more about prevailing conditions than the salesman. These same agreements gave him, also, a means for authoritatively denying a salesman's statements as to cutting by competitors, as he could communicate with the house charged with making a cut and learn both sides of the story told him.

Outside Aids to Knowledge.

Dun and Bradstreet have for a still longer period given the men at home accurate information concerning the name, business, capital and credit of firms in various branches of trade, and card systems have afforded a flexible medium for classifying and reclassifying the information thus gained to suit the varying conditions. Trade Journals have aided the sales manager by supplying classified lists of firms in various industries, and professional compilers of mailing lists have helped him to know whom to approach. All of these factors have combined to give the sales manager an intimate knowledge of the buying capacity of any firm, town or territory in any line of goods, and detailed data, against which the glittering generalities of salesmen count as naught.

How the Salesman Helped.

Even the salesman himself has been pressed into service to complete the records in the office by supplying reports as to visits made, orders taken, kinds and brands of goods handled by the firms called upon, the names of buyers, and any other intimate details which the sales manager may desire. He has not always done this willingly, but he has done it. If he has omitted his reports, his attention has been called to the fact and the reports demanded. If his reports repeatedly showed calls and no sales he has been asked to explain and to show results, and this little practice has led to the breaking up of many a comfortable arrangement with a brother traveler, to "Leave my man alone" and "I'll keep away from yours."

Systematic Records a Factor.

Monthly records of sales have furnished material for prodding salesmen to fresh efforts when the totals showed a decrease. Records of contracts for seasonable goods have enabled the sales manager to remind salesmen at the time for renewals of the places where business could be expected. In fact there are now few details of the field work which the sales manager has not mastered and which he cannot control.

Increased Competition.

One of the factors in this change is an increased competition for orders upon an evener level of values and with a generally decreased margin of profit. With a better knowledge of the amount of business to be obtained men have been more intelligently placed and the field fairly drag-netted for orders. Arrangements as to prices have resulted in less cutting, but the final result has been a lessened margin of profit with fewer sales made at unremunerative prices and fewer at exceptionally high ones.

The Vanishing Type.

The old style salesman has had to go. There has not been enough space for him to move in. To make daily reports of his movements galled him. The constant coaching of the sales manager seemed to him to savor of nagging. His fixed habits were broken up by the demands that he call upon uncongenial people and he found himself bound to undertake to sell goods where he felt that there was a bare fighting chance to succeed. The time had come when it was not deemed sufficient if he followed his accustomed route, called upon his old friends and turned in the usual amount of business from each. It was up to him to fall into line with new methods and new ideas, or if he found himself unwilling or unable to do so to step aside and give place to some one who could and would.

New Times, New Men.

The old order served its turn in its time. The old style salesman did good work and filled well the demands of his day, but it must be evident that the growth of business which has taken place in the past ten years could not have been made with the loose organizations and lack of methods of the old regime. It is the trend of the times that has developed the methods, and the most successful concerns have been the ones that have most readily recognized the benefits to be gained by their adoption.

Going—Going—

There are still a few of the salesmen of the former day, with their good stories, impatience of home government and general air of independence, but they are passing out. In the office in which this is written a good many salesmen find their headquarters. Some of them are old line salesmen who have partially fulfilled the new condition, but the greater portion are young men, mainly college graduates, who have been carefully trained for the work they have to do. The older men are good fellows and enjoyable associates, and it is not pleasant to read their names in the bulletins of changes as having been dropped from the force. But they are going, one at a time, and the eager young men who take up their work are doing it better and getting a larger business.

Higher Type of Sales Manager.

There has been a corresponding change in the sales manager and an increase in his office expense. He has had to pay for his increased power. He has had to add to his staff clerks to lay out routes, and to see that they are covered regularly and completely; data clerks to watch contracts for expirations and renewals; cost clerks to figure profits on sales and results from routes and sections of country. He has become in truth a manager, directing the movements of his men in the field with the same confidence and knowledge of details as he governs the clerks about him.

(To be continued.)

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

INGRAM-RICHARDSON MFG. COMPANY, Beaver Falls, Pa.: Illustrated folder relating to Porcelain Enameled Iron Street and Traction Signs and Numbers.

WARD-DICKEY STEEL COMPANY, Indiana Harbor, Ind.: Leaflet calling attention to the Dickey Planished Sheet Steel. It is packed in metal cases and made in gauges from 18 to 28 inclusive, the regular sizes being 28 and 30 in. wide by 60, 72 and 84 in. long. Special measurements, however, are made to order.

BERGER MFG. COMPANY, Canton, Ohio: Illustrated circular referring to Berger Steel Filing Devices and Office Equipment, including Vertical Units, Steel Sect Sectional Goods, Cabinets, Vault Omnibuses, Trucks, Tables, Transfer Boxes, Waste Baskets and special equipment built to order.

WALTER W. WOODRUFF & SONS COMPANY, Mount Carmel, Conn.: Catalogue No. 18 devoted to Carriage and Automobile Goods and Hardware Specialties. This is a complete catalogue of goods manufactured by the company. It contains 246 pages, is fully illustrated, and gives numbers, dimensions and prices of goods.

ADVANCE MFG. COMPANY, Racine, Wis.: Illustrated folder of the Hunter Reform Curry Comb, having curved corrugated bars without teeth.

F. E. KOHLER & Co., Canton, Ohio: Circulars illustrating Lawn Rakes and Post Hole Diggers, the buying season of which is now coming.

REPUBLIC METALWARE COMPANY, Buffalo, N. Y.: Descriptive pamphlet relating to the Economy Fireless Cooker, containing instructions, receipts, suggestions and hints on the subject of fireless cooking.

MASSACHUSETTS SAW WORKS, Chicopee, Mass.: Illustrated price-list of Victor Hack Saw Blades, which are made in medium, regular, fine, very fine and special grades adapted for various classes of work.

TERRELL'S EQUIPMENT COMPANY, Grand Rapids, Mich.: Illustrated catalogue of Metal Lockers, showing varieties made of sheet steel and expanded metal, in from two to six units; also Locks for lockers, steel racks and bins for stores and stockrooms.

THE ENTERPRISE ENAMEL COMPANY, Bellaire, Ohio, has a very complete exhibit at the Pittsburgh Exposition of its enameled ware goods, consisting of the Corona Ware Gift Sets, Hand-Painted Toilet Sets, Enameled Churns and Corona Roasters. These goods are finished in Electric Blue, Edelweiss, Azurelite, Ohio and Limonite.

THE HOCH HARDWARE COMPANY, Taylor, Texas, incorporated with an authorized capital of \$50,000, of which \$35,000 is paid up, succeeds the F. Hoch Hardware Company, and will continue the business along the same lines, dealing in General Hardware and Implements. The officers of the company are as follows: F. Hoch, president; H. Hoch, vice-president; T. B. Hyde, secretary and treasurer.

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The Retail Merchants' Association of St. Joseph.

M EASURED by its work and achievements, the Retail merchants' Association of St. Joseph, Mo., is entitled to a high place among the local associations of the country—organizations that are designed to promote the business interests of their members, while also benefitting the community as a whole. This association was organized in April, 1905, and, as the name indicates, covers the retail interests generally of the city of St. Joseph. Since its birth it has been under the direction of Frederick Neudorff, as president, who is well known in Hardware circles, in view of his connection with the State Association of Missouri, of which he acted as secretary for a number of years. At the present time it comprises about 50 houses handling Hardware, groceries, dry goods, harness and saddlery, clothing, house furnishings, furniture, drugs, photographic goods, jewelry, &c.

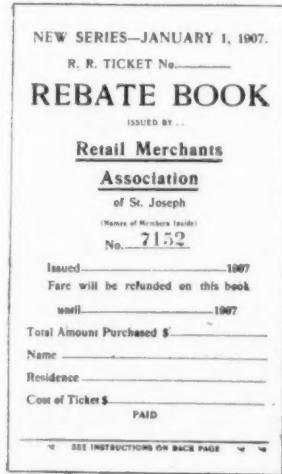
Its Public Service.

In the way of local betterment, the association has secured the practical abolition of the toll over the Missouri River Bridge at St. Joseph for both team and railroad traffic; it has assisted in building one interurban line, and has secured commutation rates for patrons of another railroad. Relative to the general welfare and development of St. Joseph, the association takes the following stand:

That the Retail Merchants' Association will withhold its moral and material support to any class, paper or other agency which seeks by creating strife between classes to carry out its aims; that it will condemn in the same manner any attempt to badger, annoy or prey upon public service or other corporations; that it is opposed to socialistic or anarchistic tendencies or effort, all of which in effect hinder the effort to develop greater St. Joseph.

Rebating Railroad Fares to Customers.

A notable feature of the association work is the rebate plan by which parties from other places are induced to visit St. Joseph for the purpose of making purchases in different lines. This takes the form of free railroad fares to and from the city, based on the amount of purchases made by the visitor. In this connection what is known as a rebate book is used, the front cover and



Front Cover of Rebate Book. A Page from the Rebate Book.

one of the pages of which are reproduced herewith. These rebate books are obtained by intending purchasers at the office of the association. To obtain the concessions purchases must, of course, be made from the members of the association only, a list of these with brief description of their business and their address being given in the book. The rebate books are presented at the association office after the visitor has completed his or her shopping and the rebate is then collected. The amount of rebate paid is as follows:

- For purchases aggregating \$10 to \$20 fare is paid within a limit of 25 miles one way.
- For purchases aggregating \$20 up to \$40 fare is

NAME OF FIRM ¹	AMOUNT PURCHASED
THE MERCHANTS' CREDIT CO., Inc. Comptiers and Publishers. 41½% Franchise.	
NEUDORFF HARDWARE CO. Hardware, Wares, Tools, Iron Furnishings, Etc. 216 S. 8th St.	
B. NEWBURGER, Millinery. 281 Polk St.	
G. LEECH-GARTON MUSIC CO. Pianos, Organs, Piano Players, Sewing Machines. 1009 N. 8th St.	
PARRISH-BRICKMAN KWY. CO. General Hardware, Stores, Furnishings, Sewing Machines 110-118 S. 8th St.	

paid within a limit of 50 miles one way or 25 miles both ways.

3. For purchases of \$40 up to \$60 fare is paid within a limit of 100 miles one way or 50 miles both ways.

4. For purchases of \$60 or more fare is paid within a limit of 150 miles one way or 75 miles both ways.

Newspaper Advertising.

A great amount of newspaper advertising is done by the association and its individual members. It is estimated that more than \$150,000 a year is expended in this way. A 30-in. advertisement is run daily in both of the leading morning and evening papers of the city. Special full page advertisements also appear at intervals in out-of-town papers. All the advertising done either by the association or the houses comprising it is guaranteed unreservedly by the association. In this connection the following extract from the constitution and by-laws of the organization will be of interest:

Any member of this association who prints or shall have printed any false, misleading or untruthful advertisement shall, upon the findings of the Grievance Committee and concurrence of the Board of Directors, if convicted, pay a fine of \$25 into the treasury of the association for first offense, and upon second conviction be expelled from the association.

St. Joseph Day.

St. Joseph or Robidoux Day (Joseph Robidoux having been the founder of the city), is celebrated on July 28. It is made a notable occasion by the association, and in addition to the usual rebates for railroad fares allowed by the association, visitors are given coupons which provide them with all sorts of entertainment while in the city on that day, including street car rides, admission to the four theatres, admission to all the concessions at the well-known amusement resort, Lake Contrary, baseball games, &c.

Premiums or Gifts to Customers.

As to giving rebates, discounts, premiums, trading stamps, or gifts of any character whatever to customers, the association has adopted the following rule:

All matters relating to scheme advertising, such as directories, church papers, programmes, cook books, telephone directories, or anything else of similar character, or subscription schemes, books or subscription papers, must be passed upon by the Board of Directors before any member can use them.

The Association Object.

The association, as described in the constitution and by-laws, has been formed for the purpose of fostering the retail trade of St. Joseph, to protect it from unjust or unlawful exactions, to reform abuses in trade, to give its members correct and reliable information as to the standing of purchasers and other matters, and to form a more enlarged and friendly intercourse between merchants engaged in the retail trade.

Officers, Directors and Committees.

The officers of the association consist of president, vice-president, secretary, and treasurer.

In addition to the Board of Directors, numbering 11, there are also the following committees: Executive, Transportation, Advertising, Publicity and Public Entertainment, Credits, Grievance and Arbitration, Charity, Legislation, Litigation, Finance, Insurance, Industrial, and Membership. Of all the committees the president is an ex-officio member.

Duties of Directors.

The duties of the Board of Directors, which meets on the third Friday of each month, are as follows:

The Board of Directors, or such committee as they shall appoint, shall examine and audit all bills rendered and all charges made against the association, and shall, through its officers, certify the same to be correct before they are paid by the treasurer. They shall also cause to be audited annually the books and accounts of the secretary and treasurer.

Duties of the Various Committees.

The duties of the different committees above named are defined as follows:

MEMBERSHIP.

To investigate all applications for membership and report to the Board of Directors with recommendations for or against the admission of each applicant.

EXCURSIONS.

To induce the railroad companies to run excursions into the city; to use the reduced rates already established by the railroad companies for conventions and the like in such way as will best serve the business interests of the members of the associa-

tion, and to run excursions on its own account and for the association upon such plans as will bring into the city the largest number of people from the territory tributary to St. Joseph.

ADVERTISING.

To investigate special advertising schemes submitted to the members of the association; to investigate the qualities and rates of the various advertising publications in use by members of the association.

PUBLICITY AND PUBLIC ENTERTAINMENT.

To give publicity to the general advantages of the city through the news columns of the press and otherwise, as the committee may deem proper; to take advantage of the running of excursions to the city for the purpose of advertising the business of the city in a general way, and to devise ways and means of keeping the city properly before the eyes of the people outside of St. Joseph and within a reasonable business radius thereof; also to take charge of and arrange for all entertainments given under the direction of the association.

CREDITS.

To collect at regular stated intervals from the members of the association the names of all persons who are not worthy of credit; to make whatever effort the Board of Directors may require for the collection of the desperate accounts of the members of the association, and to make a report at least once in every two months to all the members of the association of all persons not entitled to credit; but this committee shall not be permitted under any circumstances to divulge to other members of the association the name of the member who reported the name of any particular delinquent.

GRIEVANCE AND ARBITRATION.

To make a careful examination of all reports submitted to it by any member of the association of malfeasance of employees, of all contests and controversies between competitors, of all illegitimate and unbusinesslike competition, and all other evils and grievances suffered and endured by members of the association; to devise ways and means for the correction of all these evils, abuses and grievances, and to report their recommendation to the Board of Directors for action. Its further duty shall be to sit as a court for the purpose of investigating contentions of any sort between the members of the association which may be referred to this committee by the Board of Directors, to arbitrate such questions, and to make a report to the Board of Directors, with a full statement of its findings and recommendations of its award for benefits or damages, if there be any.

CHARITIES.

To investigate the regular charitable institutions of the city and report to the Board of Directors, with the recommendation as to which charities are worthy of support; to make special inquiry about particular charities from time to time upon request of any member of the association, and to make report with recommendation to the Board of Directors.

LEGISLATION.

To make a thorough and complete investigation of all laws and ordinances governing the merchants belonging to the association; to propose to the Board of Directors such additional laws and ordinances as are required for the better protection of the members of this association, and to secure a proper enforcement of the laws and ordinances against all those schemes which from time to time interfere and molest the legitimate business of the city.

LITIGATION.

To take full and complete charge of all litigation which may be referred to it by the Board of Directors under the constitution of the association.

EXECUTIVE.

To administer the affairs of the association by and with the advice of the president and subject to the approval of the Board of Directors.

FINANCE.

To prove all bills and accounts against the association for payment; to examine the accounts of the treasurer and make a report to the Board of Directors once each month of all receipts and expenditures of the association; to make recommendations to the Board of Directors of whatever assessments are to be made against members of the association for particular purposes; to have general supervision and control of the finances of the association, and to become responsible for the collection of all assessments and rebates, reporting to the president all delinquents when such exist.

INSURANCE.

To investigate the rates of insurance; to endeavor to secure a reduction of the costs of insurance in cases where it seems exorbitant; to collect and keep information upon insurance matters, and to assist in the adjustment of loss by any member of the association upon the written request of such member to the secretary, together with bond to cover any cost that may be incurred by the committee in such adjustment.

INDUSTRIAL.

To encourage the locating of manufacturing industries in the city of St. Joseph.

Attendance at Committee Meetings.

Any member of any committee who fails to respond to a call for a meeting by the chairman of the committee or to furnish a substitute, and does not give a reasonable excuse for such failure, is subject to a fine of \$1.

Membership.

The membership fee is \$25. As to eligibility, representation, expulsion, &c., the following extracts make clear the policy of the association:

Any person, firm or corporation engaged in the retail business and financial institutions in the city of St. Joseph shall be eligible to membership in this association. Such person, firm or corporation shall be proposed in writing by a member of the association, and indorsed by two other members thereof, and such proposal must be accompanied with a check covering the membership fee.

Such application shall be referred to the Membership Committee for investigation and by them referred to the Board of Directors for final action at their first meeting thereafter. And if the majority of the members of the Board of Directors, present at the time action on application is taken, vote in the affirmative, such person, firm or corporation shall be admitted to membership.

Any person, firm or corporation not a member of the association, buying out or in any manner taking over the business of a member of the association, shall not thereby become a member of the association, but must make application for membership after the manner specified above.

Each member of the association shall certify in writing to the Board of Directors the officers, partners or managers desired as its representatives in the association. Only such certified representatives shall be allowed to attend the meetings of the association. No member shall be entitled to more than three registered representatives nor to more than one vote on any question or resolution at any meeting of the association, and no more than one representative of any member shall be elected to the Board of Directors.

Any member or any representative of any member of this association, whose conduct shall be hostile to the objects or injurious to the character of the association, by-laws or established rules, may be suspended or expelled from the association by a two-thirds vote of the Board of Directors. No member or representative shall be suspended or expelled without an opportunity to be heard in answer to specific charges in writing of offense or violation. The Board of Directors shall be the sole judge of what constitutes an offense or violation.

That any member who shall violate the by-laws or fixed rules of this organization, upon proper proof thereof, shall be fined the sum of \$25, and upon failure to pay such fine shall be expelled from this organization, and it shall be the duty of the Publicity Committee to print notice of such expulsion in the daily papers in order that these parties may not reap any further benefits from this organization.

Any member of this association who shall dispose of his or their business, by sale or otherwise, shall thereby forfeit his or their membership in the association.

Any member whose dues are not paid within 15 days from the time the same become due may be declared suspended by the Board of Directors from the rights and benefits of the association, and if such dues are not paid within 30 days from the time that they are due, the membership of such member shall be declared forfeited, unless in the judgment of the Board of Directors there is good reason for extending the time of payment.

Whenever three members of the association shall certify to the Board of Directors that they desire to prosecute any matter within scope of the association, and shall further certify that they will prosecute said matter at their own cost and expense, the Board of Directors may authorize a special committee to prosecute such matters in the name of the Retail Merchants' Association of St. Joseph; but such committee shall not be authorized to incur any expense or create any obligation, unless the same shall be specially authorized by the Board of Directors.

Meetings.

The annual meeting of the association is held on the second Thursday of April, and five members constitute a quorum. The regular monthly meeting is held on the second Thursday of each month, except during July, August and December. Special meetings of the association can be called at any time by the president, or upon the written application of five members, the object of such meeting being stated in the notice sent out.



A NOTABLE EQUIPMENT of Steel Lockers for the Milwaukee Y. M. C. A. Building has been furnished and installed by the Terrell's Equipment Company, Grand Rapids, Mich. The installation consisted of 2000 Lockers, fitted with the company's special Keyless Combination Locks. These Locks are operated by touch or sight, and besides doing away with annoyances arising from the loss of keys they offer equal security. The company also supplied a large number of Lockers for the shops of the Grand Trunk Railway, at Battle Creek, Mich., and at Stratford, Canada, all of which were fitted with factory locks, and in addition a recent order was secured for the equipment of the new Chicago Police Station.

J. Wiss & Sons Company.

J. WISS & SONS COMPANY, Newark, N. J., manufacturer of an extensive line of Scissors, Shears, Tinsmith Snips, Razors, &c., is pursuing a liberal policy in the way of furnishing advertising matter to merchants handling its line. Special attention is being given to window displays, as has been already mentioned in our columns. A new feature of the company's advertising output is a life size cut-out of a pretty girl, attractively gowned, using a pair of Wiss Shears. The figure is well drawn and effectively colored and will naturally command attention. It is also furnished in a smaller size for use on counters, &c.

Stowell Mfg. Company's Fire.

THE press reports regarding the fire in the plant of the Stowell Mfg. Company, Jersey City, N. J., on September 8, have much exaggerated the facts. The company states that only one wing of the factory was affected and that its facilities are such as to be able to handle trade without inconvenience. Deliveries on all orders, we are advised, can be made within forty-eight hours after their receipt.

Fine Cutlery.

GRAEF & SCHMIDT, 107 Chambers street, New York, sole agents in the United States and Canada for J. A. Henckels, Solingen, Germany, have just received large shipments of Henckels' fine Cutlery, some of which is in leather case sets. Attention has been given to several small Manicure Sets for both sexes, which may be carried in vest pocket or purse, moderately priced, but handsome in appearance and of fine grade. The leading set for gentlemen is in a russet calfskin case, with end flap and metal button fastener, with four compartments, containing Nail Scissors, Corn Knife, Nail File and Tweezers. A handy set for ladies contains Nail Buffer, ribbon Nail File, Cuticle Scissors and Tweezers. The case is of russet calf, chamois lined, and is in two parts, one telescoping into the other, like a cigarette case. In the large sets for home use is one in lizard skin case, with solid under portion, and having a double folding cover, hinged at each side. It is fitted with exquisite fancy Bow Scissors, art nouveau style, the balance of the fittings, including Tweezers, Manicure Knife, Cuticle Stick, Corn Knife and Nail File, all handled in selected mother-of-pearl. Another Manicure Set is in French calf, moss finish, the colors being tints of green and blue, finely blended, and lined with silk velvet and satin to correspond. Other notable examples are elaborate Scissor Sets in three and four pieces, both in genuine Morocco and French calf cases.

Horse Shoe Taps.

The Wells Brothers Company, Greenfield, Mass., manufactures taps to thread horse shoes so as to take removable calks which screw into the shoe. The taps are made along similar lines to the regular machinist hand tap, except that they have a larger shank. They are intended for use with a tap wrench, and also flattened on one side of the shank for use in drilling machines. Both styles of taps are supplied.

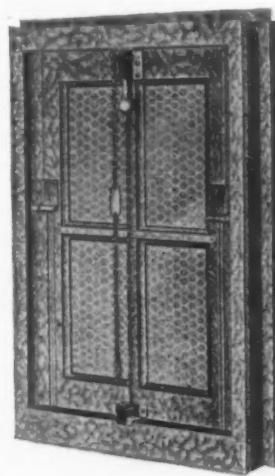
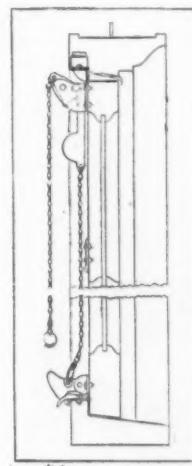
Evertite Roofing.

The Eastern Granite Roofing Company, 1 Hudson street, New York, is offering Evertite roofing, which presents to the weather a layer of crushed rock, firmly imbedded under great pressure into the composition. The rock is designed to take the brunt of the storm so that the wearing force and friction of rain drops or hail does not reach the waterproofing felt at all. The only actual wear on the top layer of composition is said to be that of slowly trickling water or melting snow, which cannot damage it a particle. It is pointed out that the surface of crushed rock takes the place of all coating or

painting, and that the roof requires no further attention of any kind after it is once laid. The company also manufactures the Tisbest and Granite brands of roofing.

The Ives Automatic Gravity Lock.

The automatic gravity lock shown in the accompanying illustrations, and manufactured by the H. B. Ives Company, New Haven, Conn., is adapted to either single or double horizontal pivoted sash. It is constructed of the best malleable iron so that the bottom of the sash

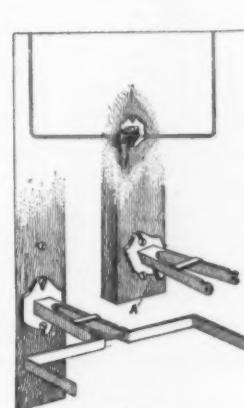


The Ives Automatic Gravity Lock.

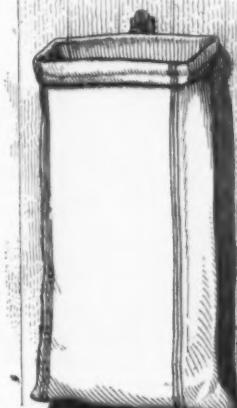
is drawn tightly against the sill on single and against the impost on double pivoted sash, at the same time the top of the sash is locked. The action is positive, locking securely both top and bottom of the sash automatically. It is said to be simple in construction, containing no springs, and has the approval of fire insurance experts. In opening the window, a pull down on the chain containing the fusible link raises the bottom catch and lifts the ball or weight, disengaging a weight or wedge in the top of the frame and allowing the sash to be opened. Releasing the ring from the hook on the bottom plate or melting the fusible link will automatically close the window from any possible position, at the same time securely locking it at both top and bottom by drawing the sash and frame tightly together. The locks are packed $\frac{1}{2}$ doz. in a box, without screws, rivets, chain or fusible links.

The Daisy Sack Holder.

A simple and convenient device to hold sacks open for filling or emptying is shown in the accompanying illustra-



No. 1.



No. 2.

The Daisy Sack Holder.

tions. It is patented and manufactured by the Wagner Mfg. Company, Cedar Falls, Iowa. The holder consists of spring steel arms attached to a malleable iron bracket, having slotted holes at the top and bottom to fit screws

or nails on any convenient wall or post. The slots are so made in the bracket that if the screws are set exactly 2 in. apart the bracket may be put up or taken down at will, its movement being indicated by A in No. 1 of the illustrations. This is accomplished without disturbing the screws which need only be set at various places where it may be convenient to use the bag, making it possible to use the holder instantly when desired. When not in use it may be folded up or laid away. The device is offered as especially convenient for use in barns, corn cribs, on scales, or where anything is to be sacked.

The Champion Double Acting Floor Hinge.

All working parts of the floor hinge, shown in Fig. 1, and manufactured by the Champion Safety Lock Company, Geneva, Ohio, are made of steel or malleable iron. They are few in number, and all of simple, strong construction. Each unit is referred to as being mechanically balanced to insure minimum wear, maximum strength

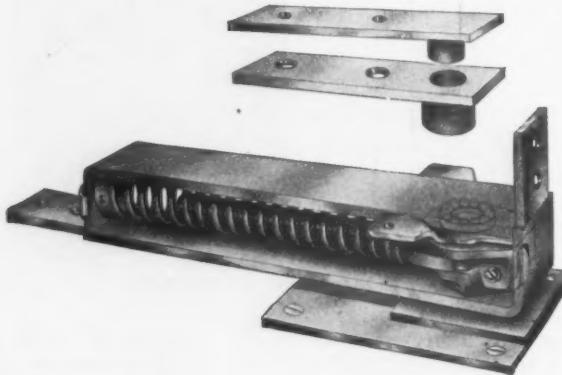


Fig. 1.—The Champion Double Acting Floor Hinge.

and reliability. The oil tempered steel compression spring is designed to afford quick, positive, quiet and smooth action, and the spring tension is readily adjusted. The entire weight of the door rests on a ball bearing located at the top of the hinge, away from water and grit, as the hinge rests upon the surface of the floor. The hinge is set by sawing out a rectangular piece at the bottom corner of the door and making a slight mortise for the strap ends of the hinge. The hinge is illustrated in Fig. 2, showing the curved lines of the side plates and

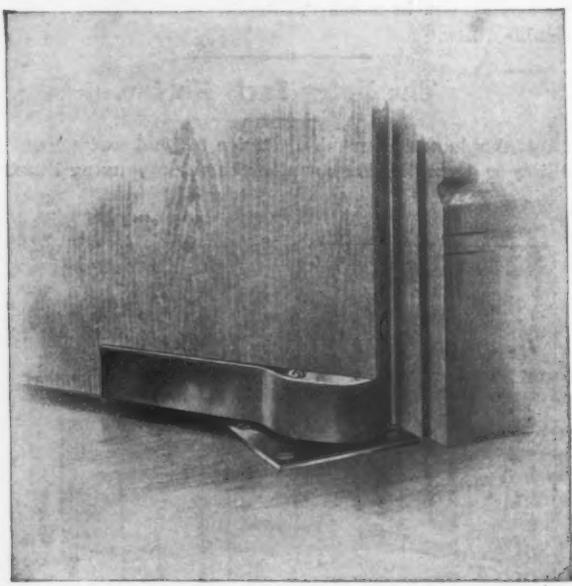


Fig. 2.—Champion Spring Attached to Door.

the finished plate at the back of the hinge. Should a door be improperly set through carelessness so as not to come to rest at right angles to the jam, it can be centered by loosening one and tightening the other adjustable screw at the back of the pivot post, without disturbing the floor plate after it has been fastened in position.

Vapor Gas Self-Heating Iron.

The Imperial Brass Mfg. Company, 245-247 S. Jefferson street, Chicago, Ill., is offering the self-heating iron here shown, for use in homes, laundries, and in pressing and dyeing houses. It is referred to as being very durable. The fuel used, wood alcohol, denatured alcohol, gasoline or benzoin, is stored in a small spun brass tank, holding 1-3 pint, which will run the iron about 2½ hours. After the tank is filled, there is a slight air pressure placed in the tank by means of a small pump supplied for



Vapor Gas Self-Heating Iron.

this purpose. The burner is then heated in the bowl of the iron by the same method that a gasoline torch is lighted. After the burner has become hot, the valve is opened, and the gas continues to be made as used, and can be turned on or off at will, thus enabling the user to regulate the heat to suit the work in hand. The fuel passing through the heated burner becomes vaporized, and then passes into a mixing chamber, where it is mixed with oxygen (or air), the proportion being about 80 per cent. air to 20 per cent. vapor gas. The total weight of the irons is 5½ lb. for the domestic and 18 lb. for the tailors'.

The Ketch-M-All Roach Trap.

A trap to catch roaches has been placed on the market by the Ketch-M-All Roach Trap Company, 1516 Fulton street, Brooklyn, N. Y. The trap, illustrated herewith, is made almost entirely of heavy pasteboard and durable paper, and is so constructed that a child can take it apart and put it together again. The body of the tube is 9 in. long and 1½ in. in width. At each end is a cone which extends 3 in. inside of the tube, and the roaches enter the trap by either cone. Once inside the trap, it is pointed out, the roach cannot escape. In the center of the trap is a small hole in which is placed a wooden reservoir to which is attached a piece of sponge,



The Ketch-M-All Roach Trap.

while a cork stops up the other end of the reservoir. The piece of sponge and about one-half of the reservoir extend inside the trap. In order to make the trap do its work it is necessary before using it the first time to grease the inside of the tube at both ends as far as one's fingers can reach, removing the cones for this purpose. After putting one cone in place, a piece of raw potato or potato peeling is put inside of the tube and the other cone is put in its place. The cork is removed and a little water is poured into the reservoir. After replacing the cork the trap is ready for the roaches. In the morning one cone is removed and the roaches accumulated over night dropped into hot water. The fact that the trap does away with poisons and obnoxious powders and liquids is one of the important points urged in its favor. It is also cheap and cleanly. The trap is intended to retail for 10 cents.

Improved Adjustable S Pipe Wrench.

The pipe wrench, illustrated herewith, is a new product of the Billings & Spencer Company, Hartford, Conn. In general design it follows the lines of the company's regular adjustable S wrench, but has a serrated jaw for use on pipe. Every part is a drop forging from steel, and the jaws are hardened. The sliding jaw is fitted in a double groove, which greatly adds to the strength



Improved Adjustable S Pipe Wrench.

of the tool. The patent thumbscrew on the adjusting knurl securely locks the jaw at any desired opening. The wrench is made in three sizes—6, 8 and 10 in.—is of careful workmanship throughout, and its design is such as to make it very useful in confined places where an ordinary wrench would be inconvenient.

The Whitney Hand Metal Punch No. 2.

A hand metal punch, manufactured by W. A. Whitney Mfg. Company, Rockford, Ill., is shown in two different positions in the accompanying illustrations. The punch weighs 10 lb., the length of the power lever is 22 in. and the capacity is a $\frac{1}{4}$ -in. hole in a $\frac{1}{4}$ -in. plate, or its equiva-



Fig. 1.—The Whitney Hand Metal Punch No. 2.

lent. The tool punches up to a $\frac{1}{2}$ -in. hole. Throwing over the upper lever, as in Fig. 2, the size of punch can be changed without the use of a tool, as there are no bolts or nuts to be removed. The die is divided, which permits a change of this part to be made quickly and easily. The depth of throat allows punching to the center of a $3\frac{1}{4}$ -in. circle. The parts are drop forged, and the holes cut clean without burrs, the smaller parts, such as studs, punches, dies, &c., being made from best tool steel. The punch is referred to as being extremely simple in construction and strongly proportioned where the strain

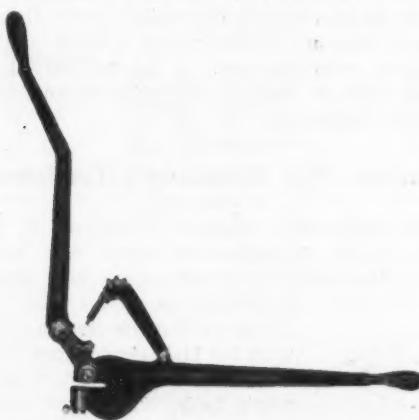
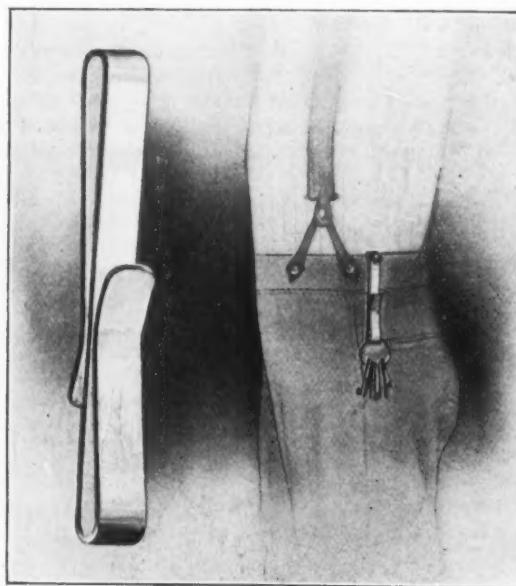


Fig. 2.—Position in Which Punch Is Changed.

comes. The punch operating upon two extra hardened inclined roller surface bearings, assisted by teeth or cogs is shown to give a powerful leverage, working with comparatively little exertion. Besides being a one-hand punch, it is light in weight and short in length and covers a wide range of work.

Centaur Key Hook.

The Sperry & Alexander Company, 21 Warren street, New York, has put out the Centaur key hook here illustrated nearly full size, and in miniature as in use. It is made of brass, polished and nickelized, and in dimensions



Centaur Key Hook.

is $2\frac{7}{8}$ x $5\frac{1}{16}$ x $1\frac{1}{16}$ in. It is offered as a convenience for carrying a bunch of keys, particularly by express employees, freight and railroad people, &c., who are constantly using them. The longer 2-in. hook is slipped on to the waistband of trousers, the strong grip of which keeps it securely in place. The key ring member is $1\frac{1}{2}$ in. long. In warm weather keys thus carried are not subject to rust from perspiration, as frequently occurs when carried in the pocket. The hooks are put up 12 on an illustrated easel display card, for counter or show window.

All Steel Street Sign Posts.

All Steel Street Sign Post.

The all steel street sign post shown in the accompanying illustration is especially made for porcelain enameled signs. The ornamental top is of cast iron and the signs are fastened to the post with brass bolts. The post is made of angle iron and is finished with a high grade of black paint. It is designed not only for use at corners where there are no buildings, but as a proper holder for all signs, as it fastens them securely and adds to the appearance. The total length of the post is 12 ft., and it is intended to be buried in the ground 3 ft., with concrete filling. It is pointed out that the post is as cheap as wood and that it will last indefinitely. It is made by the Ingram-Richardson Mfg. Company, Beaver Falls, Pa.

The T. J. Turley Company, Owensboro, Ky., which has been a jobber of Implements, Vehicles, &c., will shortly occupy a new block, which will afford 66,000 ft. floor space. The company will add a full wholesale stock of Hardware, Wooden Ware,

Soapurn.

Charles Morrill, 273 Broadway, New York, has placed on the market the Soapurn, here shown. This is a sanitary device for holding and economically delivering liquid soap. It consists of a substantial glass urn supported by a detachable bracket, attachable to either wash-stand or wall, having a locked cover at top, and at the lower end a discharge valve made of noncorrosive metal. There is also an alternative valve, seen in Fig. 3, that is pushed downward instead of upward to obtain soap. All the metallic parts are brass, polished and nickelated, the metal cover being locked into grooves mold-



Fig. 1.—Liquid Soapurn as in Use.

ed in the glass by means of the key shown, the opening being full size of urn, which permits of easily cleaning the interior. The reservoir or urn has nearly a pint capacity. The valve is simple and positive, with only one moving part, and is not dependent on gravity for its action. The liquid soap enters the upper part of the valve, and when the piston is pushed it runs down and below it, when, as the pressure of the hand ceases and the piston returns to normal, there is forced into the palm of the hand a couple of drops of soap. As from 5 to 10 drops are necessary for an average wash, contingent on the condition of the hands, it is necessary to operate the plunger several times to get a sufficient supply. In this device the valve is purposely designed to prevent wastefulness, as at no position of the plunger will there be a steady flow. The Soapurn should be placed so that its discharge orifice projects over the bowl, about 2 in. from

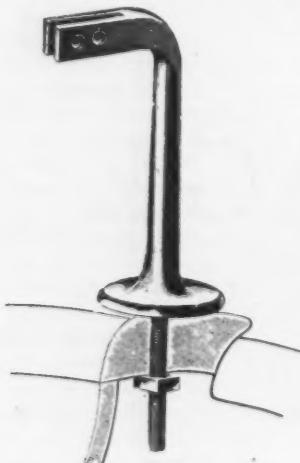


Fig. 2.—Standard Bracket.



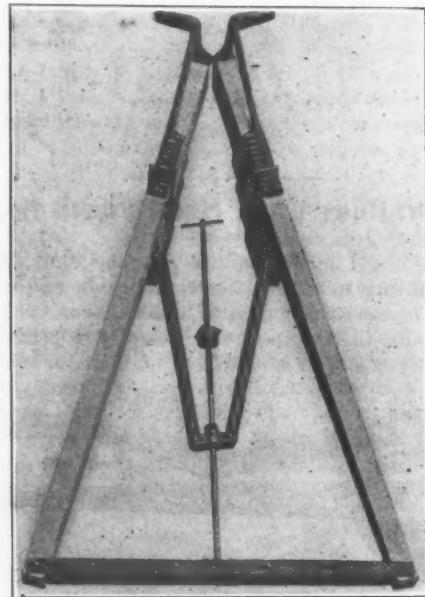
Fig. 3.—An Alternative Valve to Push Down.

its edge. All parts are put on and taken off with special spanners or keys, and all bolts are made a little longer than necessary so they may be clinched, if desired, to prevent possible surreptitious removal. The Soapurn is furnished in several styles of cover and bracket. Fig. 1 shows it bracketed to the wall or vertical slab, while

Fig. 2 illustrates a standard style of bracket for fastening to the horizontal slab or stand. Each Soapurn is carefully packed in a cellular box for shipment, with directions for installation and use.

Adjustable Window Staging.

The Neal & Brinker Company, 18 Warren street, New York, is agent for the adjustable window staging shown in the accompanying illustration. It is a portable device for the use of carpenters, painters, sheet metal workers, &c., and is made in two sizes: No. 1, 42 in. long, tested to carry up to 600 lb., and No. 2, 55 in. long, tested to carry up to 1000 lb. The arms of the staging are made of stout timber, to which the malleable iron lugs, braces, &c., are attached with screws. In the illustration the staging is shown with the arms drawn together for convenience in carrying, but when placed in a window frame



Adjustable Window Staging.

they are opened out until the lugs engage the inside of the window frame, and then braced by setting up the thumb turn which tightens the metal braces between the arms. The device is further supported by stepped wooden braces under the arms which are adjusted to the window sill by means of a malleable iron loop working on a ratchet, as shown in the illustration. One of these stagings may be used alone, or a couple of them may be employed in conjunction by setting them in adjoining windows and laying boards across them. The staging is referred to as exceedingly convenient, since they can be placed on a wagon, carried where wanted and quickly put in place, enabling men to get to work on a job quickly instead of waiting to build staging as would otherwise be necessary.

Irvington Mfg. Company's Trademark.

The Irvington Mfg. Company, Irvington, N. J., John H. Graham & Co., 113 Chambers street, New York, selling agents, has adopted the trademark here reproduced

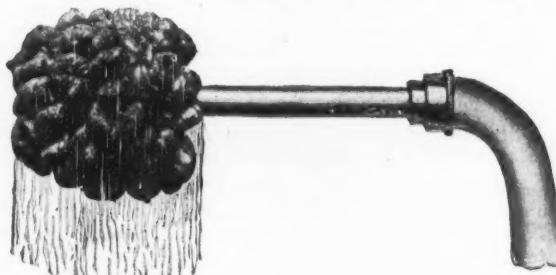


Irvington Mfg. Company's Trademark.

to numerous styles and sizes of as its emblem for use in connection with its high grade lines of American manufactured pliers and linemen's tools, which for some years have been drop forged from fine material at the above address. The company manufactures in addition linemen's pliers and splicing clamps, diagonal, long nose, duck bill, curved needle, Button and other pliers, end cutting nippers, "come alongs," tie and splicing wrenches, lag screw wrenches, plumbers' and painters' shave hooks, spring punches, and tools for piano and organ makers, tuners and regulators in great variety.

L. & M. Perfect Auto and Carriage Washer.

The Long & Mann Company, Rochester, N. Y., manufacturer of automobile tools and accessories, has put on the market the device here illustrated for washing auto-



L. & M. Auto and Carriage Washer.

mobiles and carriages. It consists of a metal nozzle to which is attached a washer or top made of cotton mop yarn. This serves the purpose of a sponge, and is said to be cheaper and more durable as well as more effective.

Tops may be renewed at minimum expense, while the pipe may be expected to last indefinitely. The latter is a 22 B. & S. gauge round brazed brass tube, with plain white finish that affords a connection for any standard $\frac{1}{2}$ or $\frac{3}{4}$ in. hose coupler. A special connection is made to fit Pittsburgh hose connections where a special thread is used. A small metal screen is furnished which screws into the washer head of the top, and can be taken out and cleaned by unscrewing with a screwdriver. The screen acts as a water distributor and prevents squirting, so that the portion of water coming through the mechanical sponge or mop yarn is equal in every direction. In recommending the washer the makers state that it is kept free from grit, so that it does not scratch polished surfaces and that it enables the operator to clean between spokes or running gear quickly and thoroughly. In using the device it is not necessary to keep the hands in water, which numbs them and makes vehicle washing an unpleasant job.

C. V. & F. W. Cameron have filed articles of incorporation to engage in the Hardware, Tinware, Paint and Sporting Goods business at Albany, N. Y.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—$\frac{3}{4}$ gal.	$\frac{3}{4}$ gal.	$\frac{3}{4}$ lb.
Linseed, State and Western, raw	12 @44	
City, Boiled	15 @46	
City, Raw	44 @45	
Raw, Calcutta, in bbls.	70 @71	
Lard, Prime, Winter	70 @72	
Extra No. 1	50 @52	
No. 1	48 @49	
Cotton-seed, Crude, f.o.b. mill	29 @29½	
Summer Yellow, prime	41 @41½	
Summer White	44 @46	
Yellow Winter	45 @47	
Tallow, Acidless	56 @53	
Menhaden, Brown, Strained	35 @36	
Northern Crude	24 @..	
Southern	24 @..	
Light Strained	35 @36	
Bleached Winter	37 @39	
Ex. Bleached Winter	39 @41	
Cocoanut, Ceylon	31 @6½	
Cochin	31 @7	
Cod, Domestic, Prime	38 @40	
Newfoundland	40 @42	
Red, Elaine	39 @40	
Saponified	31 @5½	
Olive, Yellow	30 @35	
Neatsfoot, Prime	35 @38	
Palm, Lagos	31 @5 @ 6	
Mineral Oils—		
Black, 29 gravity, 25@30 cold test	30 gal. 13 @3½	
29 gravity, 15 cold test	13½ @13	
Summer	12½ @13	
Cylinder, light filtered	20@21	
Dark, Filtered	18 @19	
Paraffine, 903-907 sp. gravity	14½@15	
903 sp. gravity	13½@14	
983 sp. gravity	11 @11½	
Red	13½@14	
Miscellaneous—		
Barter:		
White, Foreign	30 ton \$15.50@20.50	
Amer. floated	30 ton 17.00@18.00	
Off color	30 ton 12.50@15.00	
Chalk, in bulk	30 ton 3.00@3.40	
China Clay, Imported	30 ton 11.50@18.00	
Gum Shellac—	$\frac{3}{4}$ gal.	
Bleached, Commercial	23 @24	
Bone Dry	28 @22	
Button	30 @40	
Diamond I.	39 @40	
Fine, Orange	34 @35	
A. C. Garnet	27 @28	
G. A. L.	20 @21	
Kala Button	18 @19	
D. C.	40 @41	
Octagon B.	35 @36	
T. N.	25 @26	
V. S. O.	39 @40	
Colors in Oil—	$\frac{3}{4}$ lb.	
Black, Lampblack	12 @14	
Blue, Chinese	36 @46	
Blue, Prussian	32 @36	
Zinc, Dry—	$\frac{3}{4}$ lb.	
American, dry	5½@ 5%	
Red Seal (French process)	6% @ 7	
Green Seal	7½@ 7½	
German Red Seal (French process)	6% @ 7	
Green Seal	7½@ 7½	
White Seal	7½@ 8½	
French, Red Seal	8% @ 8½	
Green Seal	10% @ 10%	
Dry Colors—	$\frac{3}{4}$ lb.	
Black, Carbon	64@10	
Black Drop, American	7½@ 8	

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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ADVERTISING RATES ON APPLICATION.

New York (Main Office)	14-16 Park Place,	DAVID WILLIAMS CO., Pub.
Philadelphia	Real Estate Trust Co. Bldg., Broad and Chestnut Sts.,	S. S. RECKEFUS, Manager.
Pittsburgh	Park Building, 357 Fifth Avenue,	ROBERT A. WALKER, Manager.
Chicago	Fisher Building, Dearborn and Van Buren Streets.	A. A. AINSWORTH, Manager.
Cincinnati	Pickering Building, Fifth and Main Streets,	HENRY SMITH, Manager.
Boston	Compton Building, 161 Devonshire Street,	WALTER C. ENGLISH, Manager.
Cleveland	The Cuyahoga, 311 Superior Street,	EZRA S. ADAMS, Manager.

Remittances should be made by Draft, payable to the order of DAVID WILLIAMS COMPANY on any banking house in the United States or Europe, or by Post Office, Bank or Express Money Order on New York. When those cannot be obtained, postage stamps of any country will be received.

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ENTERED AT THE POST OFFICE, NEW YORK, AS SECOND CLASS MATTER

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus $33\frac{1}{3}$ @ $33\frac{1}{3}$ & 10% signifies

that the price of the goods in question ranges from 33½ per cent. discount to 33½ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—“The Iron Age Standard Hardware Lists” contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Fasteners, Blind—

Zimmerman's Jap'd and Galv., 50 & 5%; Bronze and Plated..... 50%
Walling's..... 50%
Upson's Patent..... 40%

Cord and Weight—

Ives, P. gro., \$1.08..... 10%
Titan, P. gro., \$0.65..... 10%

Corrugated—

Acme Corrugated Fasteners..... 10%

Faucets—

Cork Lined..... 50¢@60%

Metallic Key, Leather Lined, 60¢@10%
Red Cedar..... 40¢@40¢@10%
Petroleum..... 70¢@75%

B. & L. B. Co.: Metal Key..... 60¢@10%
Star..... 60%
West Lock..... 50@10%
John Sommer's Peerless Tin Key..... 40%
John Sommer's Boss Tin Key..... 50%
John Sommer's Victor Mt. Key..... 50@10%
John Sommer's Duplex Metal Key..... 60%
John Sommer's Diamond Lock..... 40%
John Sommer's I.X.L. Cork Lined, 50%
John Sommer's Reliable Cork Lined..... 50@10%
John Sommer's Chicago Cork Lined, 60%
John Sommer's O. K. Cork Lined..... 50%
John Sommer's No Brand, Cedar..... 50%
John Sommer's Perfection, Cedar..... 40%
Self Measuring: Enterprise, Self, Measuring and Pump, P. doz., \$36.00..... 40@10%
Lane's, P. doz., \$36.00..... 40@10%
National Measuring, P. doz., \$36.40@10%

Fellow Plates—

See Plates, Fellow.

Files—Domestic—

List Nov. 1, 1899.

**Beet Brands..... 70¢@10%@75%
Standard Brands..... 75¢@10%@80%
Lower Grade..... 75¢@10%@80%@10%
Gold Medal..... 70%
McCaffrey's American Standard, 60@10%
Imported—**

Stubs' Tapers, Stubs' list, July 24, '97..... 35¢@40%

Fixtures, Fire Door—

Richards Mfg. Co.: Universal, No. 103; Special, No. 104..... \$3.75
Fusible Links, No. 96..... 50%
Expansion Bolts, No. 107..... 60@10%

Grindstone—

Net Prices: Inch..... 15 17 19 21
Per doz..... \$3.00 3.85 4.15 4.65

Peck, Stow & Wilcox Co.: In..... 15 17 19 21 24
\$4.00 4.40 4.75 5.50 6.50..... 30%
Reading Hardware Co..... 60%

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1899, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato..... 60@10%
Victor, Hay..... 60@15&1/2%
Victor, Manure..... 65%
Victor, Header..... 65%
Champion, Hay..... 65%
Champion, Header..... 65%
Columbia, Hay..... 60@15&1/2%
Columbia, Manure..... 70%
Columbia, Spading..... 70@12%
Hawkeye Wood Barley..... 40%
W. & C. Potato Digger..... 60@10%
Acme Hay..... 60@20%
Acme Manure, 4 tine..... 60@10%
Dakota Header..... 60@20%
Jackson Steel Barley..... 60@20%
Kansan Header..... 65%
W. & C. Favorite Wood Barley..... 40%
Plated.—See Spoons.

Frames—Wood Saw—

White, S't Bar, per doz. 75@80%
Red, S't Bar, per doz. \$1.00@12%
Red, Dbl. Brace, per doz. \$1.40@15%

Freezers, Ice Cream—

Qt..... 1 2 3 4 6
Each..... \$1.25 \$1.60 \$1.90 \$2.20 \$2.50

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.**Fuse—Per 1000 Feet.**

Hemp..... \$2.75
Cotton..... \$2.20
Waterproof Sgl. Taped..... 3.65
Waterproof Dbl. Taped..... 4.40
Waterproof Tpl. Taped..... 5.15

Gates, Molasses and Oil—

Stebbins' Pattern..... 80@80%**Gauges—**

Marking, Mortise, &c., 50@50@10%
Chapin-Stephens Co.: Marking, Mortise, &c..... 50@50@10%
Dissiton's Marking, Mortise, &c. 67.4%
Wire, Brown & Sharpe's..... 33%
Wire, Morse's..... 25%
Wire, P. S. & W. Co. 33%
Gimlets—Single Cut—

Numbered assortments, per gro.

Nail, Metal, No. 1, \$2.00; 2, \$2.30

Spike, Metal, No. 1, \$1.00; 2, \$1.30

Nail, Wood Handled, No. 1, \$2.50; 2, \$2.60

Spike, Wood Handled, No. 1, \$3.30; 2, \$3.60

Glass, American Window—

See Trade Report.

Glasses, Level—

Chapin-Stephens Co..... 65@65&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush, 25¢@10@50%
Elwell's 40%

Grease, Axe—

Common Grade, gro. \$6.00@15¢@50%

Dixon's Everlasting, 10-lb. pails, ea. 85¢; in boxes, P. doz., 1 lb, \$1.20;

2 lb..... \$2.00

Helmet Hard Oil..... 25%

Griddles, Soapstone—

Pike Mfg. Co. 33¢@33¢@10%
Grinders—

Pike Mfg. Co.: Hand and Foot Power, Pyko Nos. 1, 2, 3; Pyko Primo; Pyko Peerless; Pyko Spiral (foot power), 33¢@5%
Mower Knife and Tool, \$5.00. 40@10%
Royal Mfg. Co.: Alundum Grinding Machines, each, Nos. 01, \$1.75; 1A, \$2.50; 10, \$5.00 30%
Alundum Sickle Grinders, each, Nos. 20, \$5.00; 2A, \$6.00; 2A, Combined, \$6.50 30%
Alundum Disc Grinders, each, \$2.50 30%
Grindstones—

Pike Mfg. Co.: Improved Family Grindstones, 10 inch, P. doz., \$2.00..... 33%
Richard's Mfg. Co., Eliz and Cycle, Ball Bearing, mounted..... 40%

Grips, Nipple—

Perfect Nipple Grips..... 40@10&2%

Halters and Ties—

Cow Ties..... 65@65@10%
Bridgeport Chain Co.: Triumph Coil and Halters, 35¢@25@40%
Brown Coil and Halters..... 15@50@5%
Brown Cow Ties..... 50¢@50@10&5%
Brown Tie Outs..... 75@10@75@5%
Covert Mfg. Co.: Web 30@5%
Jute Rope..... 35%
Sisal Rope..... 20%
Cotton Rope..... 45%
Hemp Rope..... 45%
Oueida Community: Am. Coil and Halters, 40@40@5%
Am. Cow Ties..... 45@50%
Niagara Coil and Halters, 45@50@5%
Niagara Cow Ties..... 45@50@10@5%
Halters—

Handled Hammers—

Heller's Machinists'..... 55@10@55@19@5%
Heller's Farriers..... 40@40@10@5%
Peck, Stow & Wilcox Co.: Crucible Steel..... 40@10@5%
Farriers..... 40@10@5%
Riveting..... 40@10@5%
Machinists'..... 60@5@5%
Blacksmiths'..... 50%
Fayatte R. Plumb: A. E. Nail, 40@24@40@12%@5%
Eng. and B. S. Hand, 50@10@5@60@5%
Machinists' Hammers..... 60@10@5%
River and Timmer, 40@7%@40@12%@5%
Victor Magnetic Tack, \$1.75

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢@60@10%
3 to 5 lb., per lb., 40¢@80@10%
Over 5 lb., per lb., 30¢@80@10%
Over 5 lb., per lb., 30¢@80@10%
Handles—

Agricultural Tool Handles—

Axe, Pick, &c., 60@10@80@10%
Hoe, Rake, &c., 40%
Fork, Shovel, Spade, &c.: Long Handles..... 40%
D Handles..... 40%
Cross-Cut Saw Handles—

Under 3 lb., per lb., 50¢@60@10%
3 to 5 lb., per lb., 40¢@80@10%
Over 5 lb., per lb., 30¢@80@10%
Over 5 lb., per lb., 30¢@80@10%
Handles—

Long Handles—

D Handles..... 40%
Mechanics' Tool Handles—

Auger, assorted, gro. \$3.00@3.50

Brad Awl, gro. \$1.65@1.75

Chisel Handles, Ass'd, per gro.: Tanged Firmer, Apple, \$2.40@

\$2.65; Hickory..... \$2.15@2.40

Socket Firming, Apple, \$1.75@

\$1.95; Hickory..... 1.60@1.75

Socket Framing, Hickory, \$1.60@1.75

File, assorted, gro. \$1.30@1.40

Hammer, Hatchet, &c., 60@10@60@10%
Hand Saw, Varnished, doz., 80¢@85¢; Not Varnished..... 65@75¢
Plane Handles: Jack, doz., 30¢; Fore, doz., 45¢
Chapin-Stephens Co.: Drilling Tool..... 30@30@10%
Chisel..... 60@60@10%
File and w'l..... 60@60@10%
Saw and Plane..... 30@30@10%
Screw Driver..... 30@30@10%
Millers Falls Adj. and Ratchet Anger Handles..... 15@10%
Nicholson Simplicity File Handle, gro. \$0.85@1.50

J. L. Osgood: Indestructible File and Tool, 90 gro., No. 1, \$8.00; No. 2, \$8.50; No. 3, \$9.00; No. 4, \$9.50; No. 5, \$10.00; gro. lots 10%..... 40%
W. A. Zehnder Supply Co.: Hammer, P. doz., 12 in., \$2.00; 14 in., \$2.00; 16 in., \$2.30; 18 in., \$2.50; 20 in., \$2.70; 22 in., \$3.00; 24 in., \$3.30; 26 in., \$3.50; 30 in., \$3.80; Sledge, 30 doz., oval, 30 in., \$3.80; octagon, 30 in., \$3.80; oval, 36 in., \$4.00; octagon, 36 in., \$4.00; Axe, P. doz., 28 to 34 in., \$5.60; 36 in., \$5.80; Adze, 30 doz., 36 in., \$5.80; 36 in., \$7.80; Pick, 30 doz., R. R., 36 in., \$8.00; coal, 34 in., \$5.80; Hatchet, P. doz., 12 to 14 in., \$2.00.

Hinges—**Blind and Shutter Hinges—**

Surface Gravity Locking Blind: Doz. Sets with Fastenings, Net, No. 1, \$0.70; No. 3, \$1.25; No. 5, \$2.65

Clark Coat, P. doz., \$0.75..... 20%

Hinges—Garment—

Pullman Trouser, P. gro., No. 1 \$9.00; No. 4, \$24.00; No. 5, \$16.50; No. 8, Black Enamel, \$7.50; No. 10, \$21.00; No. 12, \$8.00; No. 15, Rods, \$9.00; No. 18, Loops..... \$10.00

Victor Folding, P. gro. \$9.60

Gate—

Myers' Patent Gate Hangers, P. doz., net..... 50%

Joist and Timber—

Lane Bros. Co..... 35%

Haps—

Griffin's Security Haps..... 50@10%
McKinney's Perfect Haps, P. doz. 60%

Hatches—

Regular list, first qual. 50¢@12%@—
Second quality..... 50¢@10%@—

Heaters, Carriage—

Clark, No. 5, \$1.25; No. 5B, \$1.50; No. 3, \$1.75; No. 1D, \$2.00; No. 1D, \$2.25; No. 3E, \$2.50; No. 1, \$3.00..... 25%

Clark Coat, P. doz., \$0.75..... 20%

Hinges—**Blind and Shutter Hinges—**

Surface Gravity Locking Blind: Doz. Sets with Fastenings, Net, No. 1, \$0.70; No. 3, \$1.25; No. 5, \$2.65

Clark Coat, P. doz., \$0.75..... 20%

North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50..... 20%
Charles Parker Co. 70@75%
Parker Wire Goods Co.: Hale & Benjamin Automatic Blind Hinges..... 20%
Hale's Blk. Awning Hinges, No. 110, for wood, \$9.00; No. 111, for brick, \$9.00..... 20%
Reading's Gravity..... 60%
Stanley's Steel Gravity Blind Hinges, No. 1647½, 20 doz. sets, without screws, \$9.95; with screws, \$1.25.

Wrightsville Hardware Co.:

O. S. Lull & Porter..... 75@5%

Acme Lull & Porter..... 75@5%

Queen City Reversible..... 75@5%

Shepard's Noiseless, Nos. 60, 65, 75..... 75@5%

Niagara, Gravity Locking, Nos. 1, 3 & 5..... 75@5%

Clark's O. P., No. 1..... 75@10%

Hoes—Coal—

Mifgr's list, price per gross:

Inch..... 15 16 17 18

Galv. Open..... \$5 \$9 \$9 \$14

Jap. Open..... 26 28 31 35

Galv. Funnel..... 43 48 52 56

Jap. Funnel..... 33 36 59 43

Hoes—Eye—**Scovil and Oval Pattern—**

60¢@10@60¢@10%@

Grub, list Feb. 23, 1899.

70¢@10@70¢@10@10%@

D. & H. Scovil..... 21/2

Am. Fork & Hoe Co. (Scovil Pattern)

60%

Hoes—Eye—**Scovil and Oval Pattern—**

60¢@10@60¢@10%@

Grub, list Feb. 23, 1899.

70¢@10@70¢@10@10%@

D. & H. Scovil..... 21/2

Am. Fork & Hoe Co. (Scovil Pattern)

60%

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track and Parlor Door Hangers per double set with track, &c.

Chicago Spring Butt Co.: Friction 25%
Oscillating 25%
Big Twin 25%
Chisholm & Moore Mfg. Co.: Baggage Car Door 50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.: Loose Axle 60@10%
Roller Bearing 70%
Griffin Mfg. Co.: Solid Axle, No. 10, \$12.00, 60@10%
Roller Bearing, No. II, \$15.00, 60@10%
Lane Bros. Co.: Roller Bearing, Ex. Hy., No. 22, \$18.00, 60@10%
Bull Dog, \$24.00, 70%
Lane Bros. Co.: Parlor, Ball Bearing, \$4.00:
Standard, \$3.15; No. 105, \$2.85; New Champion per set of 4 Hangers, complete with track, \$2.25
Barn Door, Standard, 60@10%
Hinged, \$6.08
Covered 60@5%
Special 70@5%
Trolley Hangers and track, 50%
Lane Bros. Co.: Parlor, Ball Bearing, \$4.00:
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Barn Door, Standard, 60@10%
Hinged, \$6.08

Picks and Mattocks—

(List Jan., 1908.)
 List 70@10@70@10@10%
 Cronk's Handled Garden Mattock,
 1 lb. doz., \$3.00 33½%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass 50@50@10%
 Iron, list Nov. 11, '85 60@60@10%

Pipe, Cast Iron Soil—

Standard, 2-6 in. 70@10%
 Extra Heavy, 2-6 in. 75@10@10%
 Fittings, Standard and Heavy, 80@10@80@10@10%

Pipe, Merchant—

Consumers, Carloads,
 Steel, Iron,
 Blk. Galv. Blk. Galv.,
 % % X %
 1/8 and 1/4 in. 66 50 61
 1/2 in. 68 54 66 52
 3/4 in. 70 58 68 56
 5/8 to 6 in. 74 64 72 62
 7 to 12 in. 71 56 69 54

Pipe, Vitrified Sewer—

Carload lots.

Standard Pipe and Fittings, 3
 to 2½ in., f.o.b. factory:
 First-class 87%
 Second-class 90%

Pipe, Stove—

Per 100 joints,
 Edwards' Nested: C. L. L. C. L.
 5 in., Standard Blue \$6.25 \$7.25
 6 in., Standard Blue 6.75 7.75
 7 in., Standard Blue 7.75 8.75
 5 in., Royal Blue 7.00 8.00
 6 in., Royal Blue 7.50 8.50
 7 in., Royal Blue 8.50 9.50
 Wheeling Corrugating Co.'s Nested:
 5 in., Uniform Color \$5.90 \$6.90
 6 in., Uniform Color 6.40 7.40
 7 in., Uniform Color 7.40 8.40

Planes and Plane Irons—**Wood Planes—**

Bench, first qual. 30@30@10%
 Bench, second qual. 40@40@10%
 Molding 25@25@10%
 Chapin-Stephens Co.:
 Bench, First Quality 30%
 Bench, Second Quality 40%
 Molding and Miscellaneous 25%
 Toy and German 30%
 Union 60%

Iron Planes—

Chaplin's Iron Planes 60%
 Union 60%

Plane Irons—

Wood Bench Plane Irons, list
 Dec. 12, '06 25%
 Buck Bros. 30%
 Chapin-Stephens Co. 25%
 Union 50%
 L. & J. White. 20&50@25%

Planters, Corn, Hand—

Kohler's Eclipse 70 doz. \$7.50

Plates—

Fellow lb. 3%@4%
 Avery Stamping Co.:
 Standard Wrot. Steel Fellow Plates

in 100 lb. kgs., per 100 lb. 3/4-in. to
 1½-in., \$4.00 net; 1½-in. to 2-in.,
 inclusive, \$3.75 net.

Steel Pipe Hook—

Never-Break 75@10%
 Pliers and Nippers—

Benton Pliers 75@50@75@10@5%
 Gas Burners, per doz., 5 in., \$1.25
 @1.30; in., \$1.45 \$1.50.

Gas Pipe 7 8 10 12-in.
 \$2.00 \$2.25 \$2.75 \$3.50

Acme Nippers 50&5%
 Cronk & Carrier Mfg. Co.:
 American Button 80%
 Improved Button 75@10%
 Cronk's 60%
 No. 39 Linemen's 50%
 Stub's Pattern 45%
 Combination and others 33½%

Heller's Farriers' Nippers, Pincers
 and Tools. 10&5@10&5%
 P. & S. & W. Timmers' Cutting Nip-
 pers 40%
 Swedish Side, End and Diagonal
 Cutting Pliers 50%
 Utica Drop Forge & Tool Co.:
 Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
 Plumb and Levels 30@30@10%
 Chapin's Imp. Brass Cor. 40@40@10%
 Pocket Levels 30@30@10%
 Extension Sights 30@30@10%
 Machinists' Levels 40@40@10%
 Diston's Plumb and Levels 60@10%
 Diston's Pocket Levels 60@10%
 Stanley's Duxel 35%
 Woods' Extension 33½%

Points, Glaziers'—

Bulk and 1-lb. papers 3. 9
 1/2-lb. papers lb. 9½
 1/4-lb. papers lb. 10 4

Police Goods—

Manufacturers' Lists 25@25@5%

Tower's 25%

Polish—Metal, Etc.—

Ladd Co.:
 Putzade Liquid, 10 doz. 1/2 pts.,
 \$12.00; 1 pts., \$20.00; 1 qt., \$40.00;
 1/2 doz. 1/2 gals., \$6.35; 1 gals., \$12.00.

Prestoline Liquid, No. 1 (1/2 pt.), 10
 doz., \$3.00; No. 2 (1 qu.), \$3.00. 40%
 Prestoline Paste 40%

Picks and Mattocks—

(List Jan., 1908.)
 List 70@10@70@10@10%
 Cronk's Handled Garden Mattock,
 1 lb. doz., \$3.00 33½%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass 50@50@10%
 Iron, list Nov. 11, '85 60@60@10%

Pipe, Cast Iron Soil—

Standard, 2-6 in. 70@10%
 Extra Heavy, 2-6 in. 75@10@10%
 Fittings, Standard and Heavy, 80@10@80@10@10%

Pipe, Merchant—

Consumers, Carloads,
 Steel, Iron,
 Blk. Galv. Blk. Galv.,
 % % X %

Pipe, Merchant—

Consumers, Carloads,
 Steel, Iron,
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 Blk. Galv. Blk. Galv.,
 % % X %

Pipe, Merchant—

Saws—

Atkins': Circular	45%
Band	50@50&10%
Butcher Saws	50%
Cross Cuts	35%
One-Man Cross Cut	40%
Narrow Cross Cut	50%
Hand, Rip and Panel	35&5%
Miter Box and Compass	40%
Mulay, Mill and Drag	45%
Wood Saws	40&10%
Chapin-Stephens Co.:	
Turning Saws and Frames	30@30&10%
Diamond Saw & Stamping Works:	
Sterling Kitchen Saws	30@10&10%
Dissiton's:	
Circular, Solid and Inst'd Tooth	50%
Band, 2 to 18 in. wide	60%
Band, 1/4 to 1%	60%
Crosscuts	45%
Narrow Crosscuts	50%
Mulay, Mill and Drag	50%
Framed Woodsaws	25%
Woodssaw Blades	25%
Woodssaw Rods, Tinned	15%
Hand Saws, Nos. 12, 22, 9, 16, d100, D8, 120, 76, 77, 8,	25%
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1, 9, 00, Combination	30%
Compass, Key Hole, &c.	25%
Butchers Saws and Blades	30%

C. E. Jennings & Co.'s:

Back Saws	16%
Butcher Saws	25&71/2%
Compass and Key Hole Saws	33 1/2&71/2%
Framed Wood Saws	25&71/2%
Hand Saws	12%
Wood Saw Blades	33 1/2&71/2%
Millers Falls:	
Butcher Saws	15&10%
Star Saw Blades	15&10%
Massachusetts Saw Works:	
Victor Kitchen Saws	40&10&50%
Butcher Saws Blades	35@10%
Peace & Richardson's Hand Saws	30%
Simonds':	
Circular Saws	45%
Crescent Ground Cross Cut Saws	30%
One-Man Cross Cuts	40&10%
Gang Mill, Mulay and Drag Saws	45%
Band Saws	50%
Back Saws	25@25&71/2%
Butcher Saws	35@25&71/2%
Hand Saws	25@25&71/2%
Hand Saws, Bay State Brand	45%
Compass, Key Hole, &c.	25@25&71/2%
Wood Saws	40&71/2%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws	50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A A A	25%
Dissiton's:	
Concave Blades	25%
Keystone Blades	35%
Hack Saw Frames	30%
Simonds, 25%; The Best, 35%	35%
Culley	35%
C. E. Jennings & Co.'s:	
Hack Saw Frames, Nos. 175, 180, 185, 190	40&71/2%
Hack Saws, Nos. 175, 180, complete	40&71/2%
Goodell's Hack Saw Blades	40&10%
Griffin's Hack Saw Frames	35&5&10%
Griffin's Hack Saw Blades	35&5&10%
Star Hack Saws and Blades	15&10%
Sterling Hack Saw Blades	30&10&5%
Sterling Hack Saw Frames	30&10&10%
Sterling Power Hack Saw Machines, each, No. 4, \$25.00; No. 2, \$30.00, 10%	
Victor Hack Saw Blades	20%
Victor Hack Saw Frames	40%
Whitaker Mfg. Co.:	
National Hand Blades, Hand Frames, Power Blades	40%

Scroll—

Barnes, No. 7, \$15.	25%
Barnes' Scroll Saw Blades	40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, \$18; with boring attachment, \$20.	20%
Lester, complete, \$10.00.	15&10%
Rogers, complete, \$3.50 and \$4.00.	15&10%

Scales—

Union Platform, Plain	\$2.10@2.20
Union Platform, Stpd.	\$2.20@2.30
Chatillon's:	
Eureka	25%
Favorite	40%
Grocers' Trip Scales	50%
The Standard Portables	40%
The Standard R. R. and Wag. on	50&10%

Scrapers—

Box, 1 Handle	doz. \$1.85@2.10
Box, 2 Handle	doz. \$2.35@2.50
Ship, Light	\$2.00; Heavy, \$4.50
Chapin-Stephens Co., Box.	30@30&10%
Richards Mfg. Co., Foot	60%

Screws—Bench and Hand

Bench, Iron, doz., 1 in.	\$2.50@
1 1/2, \$1.00@3.25; 1 1/4, \$3.50@3.75	
Coach, Wood	20@20&10%
Hand, Wood	70@70@70@10@10%
Chapin-Stephens Co., Hand	70@70@10@20%

Coach, Lag and Hand Rail—

Lag, Cone Point	30@5@70@80@10%
Coach, Gimlet Point	80@80@55%
Hand Rail	70@10@75%

Jack Screws—

Standard List	70@10@75%
Millers Falls	50@10@10%
Swett Iron Works	70@75%

Machine—

Cut Tread, Iron, Brass or Bronze:	
Flat Head or Round Head	50@50&10%
Fillister Head	10@10@10%

Rolled Thread, F. H. or R. H., Iron	75@10%
F. H. or R. H., Brass, Nos. 8 to 14	65@10%

Set and Cap—

Set (Iron)	75@10@71/2%
Set (Steel), net advance over Iron	25%
Sq. Hd. Cap.	70@10@71/2%
Hex. Hd. Cap.	70@10@71/2%
Rd. Hd. Cap.	50@71/2%

Wood—

List July 23, 1903.	
Flat Head, Iron	87@25@10%
Round Head, Iron	85@25@10%
Flat Head, Brass	80@25@10%
Round Head, Brass	77@25@10%
Flat Head, Bronze	75@25@10%
Round Head, Bronze	72@25@10%
Drive Screws	87@25@10%

Scroll Saws—

See Saws, Scroll.

Scythes—

Per doz.

Grass, No. 1, Plain	\$7.00
Clipper, Bronzed Webb	\$7.25
No. 3 Clipper, Pol'd Webb	\$7.50
No. 6 Clipper and Solid Steel	\$7.75
Bush, Weed and Bramble, Nos. 11, 12 and 13	\$7.25
Grain, No. 1	\$9.00@9.50
Bronzed Webb, No. 1	\$9.25@9.75
Nos. 3 and 4 Clipper, Grain	\$9.50@10.00
Solid Steel, No. 6	\$10.00@10.50

Seeders, Raisin—

Enterprise 25@30%

Sets—Awl and Tool—

Fray's Tool Handles, Nos. 1, 12; 2, 16; 3, 12	50%
Millers Falls Adj. Tool Handles, No. 1, 12; No. 4, \$12; No. 5, \$18; 20&10%	

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel	\$.00
Enterprise	\$.00

Rivet—

Regular list	.75@75@10%
Saw—	

Sets, Nail—

Octagon	gro. \$3.50@3.75
Buck Bros.	\$.00
Mayhew's	\$.00
Snell's Corrugated, Cup Pt.	40&10%
Snell's Kneaded, Cup Pt.	40&10%
Victor Kneaded, Cup Pt.	\$.00

Rivet—

Regular list	.75@75@10%
Saw—	

Sets, Nail—

Atkin's Criterion	40%
Adjustable	40%
Douston's Star, Monarch and Triumphant	30%
Morrill's No. 1	\$15.00
Nos. 3 and 4, Cross Cut	\$20.00
No. 5, Mill.	\$30.00
No. 10, II, III	\$15.00
No. 1 Old Style	\$10.00
Giant Royal Cross Cut	\$.00
Royal, Hand	\$.00
Taintor Positive	\$.00

Shaving—

Fox Shaving Sets, No. 30	\$.00
Smith & Hemenway Co.'s	.75@10%
Sharpeners, Knife—	
Pike Mfg. Co.:	
Fast Cut Pocket Knife Hones	\$.00
Mounted Kitchen Sand Stone	\$.00
Natural Grit Carving Knife Hones	\$.00
Quick Cut Emery Carving Knife Hones	\$.00
Quick Edge Pocket Knife Hones	\$.00
Smith & Hemenway Co., Eureka	.50@10%
Shaves, Spoke—	

Shaves, Spoke—

Iron	.00
Wood	.00
Bailey's (Stanley R. & L. Co.)	.45
Chapin-Stephens Co.	.30@30@10%
Goodell's, \$.00	.15@15@10%

Shears—

Cast Iron	7
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Scythe Stones—

Pike Mfg. Co., 1907 list:
Black Diamond S. S. 1/2 gro. \$12.00]
Lamoille S. S. 1/2 gro. \$11.00]
White Mountain S. S. 1/2 gro. \$9.50]
Green Mountain S. S. 1/2 gro. \$7.00]
Extra Indian Pond S. S. 1/2 gro. \$8.00]
No. 1 Indian Pond S. S. 1/2 gro. \$7.50]
No. 2 Indian Pond S. S. 1/2 gro. \$5.00]
Leader Red End S. S. 1/2 gro. \$5.00]
Quick Cut Emery 1/2 gro. \$10.00]
Pure Corundum 1/2 gro. \$18.00]
Crescent 1/2 gro. \$7.00]
Emery Scythe Rifes 2 Coat. \$8.80]
Emery Scythe Rifes 3 Coat. \$11.00]
Emery Scythe Rifes 4 Coat. \$13.20 J]
Balance of 1907 list 33 1/2%
Lectro (Artificial), 1/2 gro. \$12.00 33 1/2%
Lightning (Artificial), 1/2 gro. \$18.00 33 1/2%

Stoppers, Bottle—

Victor Bottle Stoppers.... 1/2 gro. \$9.00

Stops—Bench—

Millers Falls..... 15&10%
Morrill's, 1/2 doz., No. 1, \$10.00..... 50%
Morrill's, No. 2, \$12.50..... 50%

Door—

Chapin-Stephens Co..... 50&50&10%

Plane—

Chapin-Stevens Co..... 20%

Straps—Box—

Acme Embossed, case lots. 20&10&10%

Cary's Universal, case lots. 20&10&10%

Stretchers, Carpet—

Cast Iron, Steel Points.... doz. 55¢

All Steel Socket.... doz. \$2.00@25

Excelsior Stretcher and Tack Hammer Combined, 1/2 doz. \$6.00.... 20%

Stuffers, Sausage—

Enterprise Mfg. Co., Stuffers and Lard Presses..... 25@25&7 1/2%

National Specialty Co., list Jan. 1, 1902..... 30&5%

P. S. & W. Co..... 40&10&5%

Sweepers, Carpet—**Per doz.—**

Bissell Carpet Sweeper Co.: Cyco Bearing Superba, \$36.00;
Triumph, \$33.00; Parlor Queen, \$30.00; Elite, \$29.00; Boudoir, \$27.00; American Queen, \$27.00; Ideal, \$25.00; Gold Medal, \$24.00; Premier, \$24.00; Prize, \$24.00; Welcome, \$24.00; Grand Rapids, Nickel, \$24.00; Japan, \$22.00; Crystal, \$36.00; Grand, \$36.00; Parlor Grand, \$48.00; Club, \$54.00; Hall, \$60.00; Standard Nickel, \$22.00; Standard Japan, \$20.00; Crown Jewel, Nickel, \$21.00; Crown Jewel, Japan, \$19.00; Junior, Nickel, \$22.00; Junior, Japan, \$20.00.
NOTE. Rebates: 50¢ per dozen on three dozen lots; \$1 per dozen on five dozen lots; \$3 per dozen on ten dozen lots.
Tacks, Finishing Nails, &c.
American Carpet Tacks.... 90¢@10%
American Cut Tacks.... 90¢@10%
Suedes' Cut Tacks.... 90¢@10%
Suedes' Upholsterers'.... 90¢@10%
Gimp Tacks.... 90¢@10%
Lace Tacks.... 90¢@10%
Trimmers' Tacks.... 90¢@10%
Looking Glass Tacks.... 65¢
Bill Posters' and Railroad Tacks, 90¢@10&10%
Hungarian Nails.... 80¢@10%
Finishing Nails.... 70¢
Trunk and Clout Nails.... 80¢@10%

NOTE.—The above prices are for straight weights.

Miscellaneous—

Double Pointed Tacks, 90¢@10%

Se also Nails, Wire.

Tanks, Oil and Gasoline—

Wilson & Friend Co.: Gal. Gasoline
30 \$2.75
60 \$3.50
110 \$5.00

\$0.75

Tapes, Measuring—

American Asacs' Skin.... 50¢@10%

Patent Leather.... 25@30&5%

Steel.... 33 1/2¢@5¢

Chesterman's.... 25@25&5%

Keuffel & Esser Co.: Favorite, Ass Skin.... 40&10@50%

Favorite, Duck and Leather.... 25@25@10%

Metallic and Cloth, lower int. 35¢@5%, Pocket, 35@35&5%.

Lukfing: Asses' Skin.... 40&10@50%

Metallic.... 30@30@5%

Patent Bend, Leather.... 25@25@10@5%

Pocket.... 40@40@5%

Steel.... 33@35@5%

Wiebush & Hilger: Chesterman's Metallic, No. 34L, etc.... 25%

Chesterman's Steel, No. 1038L, etc.... 35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, 1/2-inch and larger, per 100 lb.... \$2.55@22.5%

Thermometers—

Tin Case, Cabinet, Flange, Dairy, &c.... 30@35%

Ties, Bale—Steel Wire—

Single Loop.... 82 1/2¢@10%

Monitor, Cross Head, &c. 70@21 1/2%

Tinners' Shears, &c.—

See Shears, Tinners', &c.

See Shears, Tinners', &c.

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Binders, Upsetters, &c.

See Binders and Upsetters, Tire.

Tools—Coopers'—

L. & I. J. White.... 20@20&5%

Haying—

Myers' Hay Tools.... 50%

Ice Tools—

Gifford-Wood Co.... 15%

Miniature—

Smith & Hemenway Co.'s, Davidson, 1/2 doz., Nickel Plated, \$1.50; Gold Plated.... 2.00

Saw—

Atkins' Cross Cut Saw Tools.... 35&5%

Simond's Improved.... 33 1/2%

Simond's Crescent.... 30

Ship—

L. & I. J. White.... 25%

Torches—

Hammers, Engine, 1/2 doz.... 4.50

Transom Lifters—

See Lifters, Transom.

Traps—Fly—

Balloon, Globe or Acme, doz., \$1.15@1.25; gro. 1.15@1.20

Harper, Champion or Paragon, doz., \$1.25@1.40; gro. \$1.30@1.35

Game—

Imitation Oneida.... 75@10%

Newhouse.... 50¢

Hawley & Norton.... 65&1/2¢

Victor.... 75@75&10¢

Oneida Community Jump.... 70@5%

Stop Thief.... 60¢

Tree Trap.... 60¢

Hector.... 75@75&10¢

Mouse and Rat—

Mouse, Wood, Choker, doz., holes, 12¢

Mouse, Round or Square Wire, doz. 85@90¢

Marty French Rat and Mouse Traps (Genuine), 1/2 doz.:

Crate lots, Small lots,

No. 1, Rat.... \$1.50

No. 3, Rat.... \$5.75

No. 3 1/2, Rat.... \$4.70

No. 5, Mouse.... \$2.25

Animal Trap Co.:

Out o' Sight, Mouse, 1/2 doz.... 80¢

Out o' Sight, Rat, 1/2 doz.... 1.20

Easy Set, Mouse, 1/2 doz.... 35

Easy Set, Rat, 1/2 doz.... 85

Out o' Sight, Chockers, 1/2 doz., holes, 12

Out o' Sight, Tin, 5-hole, 1/2 doz., traps.... 75

Trowels—

Distant Brick and Pointing.... 25%

Distant Plastering.... 20%

Distant "Standard Brand" and Garde-Trowels.... 30%

Kohler's Steel Garden Trowels, 1/2 gro., 5 in. \$4.80; 6 in. \$6.00.

Never-Break, Forged Steel Garden Trowels, in bulk, net 1/2 gro. \$5.50

In 1 doz. boxes.... 1/2 gro. \$6.00

Woodrough & McParlin, Plastering.... 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.: New York Pattern.... 50&10%

Western Pattern.... 60&10%

Handy Trucks.... 16@16

Grocery.... 16@15

McKinney Trucks.... each, net \$10.00

McDowell Stove Trucks.... 1/2 doz. \$18.50

Tubs, Wash—

M'F'r's list, price per gross.

No. 0 1 2 3

Galvanized \$67 579 839 999 10¢@7 1/2%

65¢@5%

Twine, Miscellaneous—

Flax Twine:

No. 9, 1/4 and 1/2-lb. Balls. 21@23¢

No. 12, 1/4 and 1/2-lb. Balls. 19@21¢

No. 18, 1/4 and 1/2-lb. Balls. 16@18¢

No. 24, 1/4 and 1/2-lb. Balls. 15@17¢

No. 36, 1/4 and 1/2-lb. Balls. 15@17¢

Chalk Line, Cotton 1/2-lb.

Balls.... 24@29¢

Cotton Mops, 6, 8, 12 and 15 lb.

to doz.... 8¢@19¢

Cotton Wrapping, 5 Balls to lb.

according to quality, 18¢@19¢

American 2-Ply Hemp, 1/4 and 1/2-lb. Balls.... 12¢@15¢

Am. 3-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

Am. 5-Ply Hemp, 1/4-lb. Balls.... 18¢@16¢

India 2-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 3-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 5-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 7-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 9-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 11-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 13-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 15-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 17-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 19-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 21-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 23-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 25-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 27-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 29-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 31-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 33-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 35-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 37-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 39-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 41-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 43-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 45-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 47-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 49-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 51-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 53-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 55-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 57-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 59-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 61-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 63-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 65-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 67-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 69-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 71-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 73-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 75-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 77-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 79-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 81-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 83-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 85-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 87-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 89-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 91-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 93-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 95-Ply Hemp, 1/4-lb. Balls.... 12¢@15¢

India 97-Ply Hemp, 1/4-lb. Balls.... 12¢

